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The Impact of Marital Satisfaction on the Utilization of Mental Health Services Among Soldiers

Dana Lee Varkis
Clemson University

THE IMPACT OF MARITAL SATISFACTION ON THE UTILIZATION OF MENTAL HEALTH SERVICES AMONG SOLDIERS

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Dana Lee Varkis
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Committee Members:
Dr. Mark Small, Committee Co-Chair
Dr. Natallia Sianko, Committee Co-Chair
Dr. Thomas Britt
Dr. Bonnie Holaday

ABSTRACT

Objective: The underutilization of mental health services amongst military personnel is significant, especially among those who screen positive for mental health disorders. The factors that may deter or facilitate mental health utilization are varied and complex. The mechanisms through which these barriers and facilitators operate as well the conditions under which they have the most or least influence remain under examined. The current study examined factors associated with mental health service use and tested marital satisfaction as moderator of relationship between barriers to care and utilization and mental health symptoms and utilization. *Method*: The study analyzed data from anonymous surveys completed by 452 soldiers in Army combat units prior to deployment and three months post-deployment. *Results*: Education at post-deployment period, marital status at both time periods, and depression at both time periods were significantly associated with mental health utilization. Marital status and marital satisfaction did not moderate the relationship between barriers to care and utilization. Marital status was a significant predictor of utilization, with the greatest odds of utilization found to be among divorced soldiers, followed by married soldiers. PTSD was a predictor of mental health service utilization prior to deployment and following deployment. Marital satisfaction interacted with depression to predict utilization with the odds of utilization increasing among those with lower marital satisfaction. *Conclusions*: Marital relationships can play an important role in the military's efforts to promote mental health service utilization. Further research should examine and interventions promote the conditions under which marital satisfaction can deter or facilitate mental health service utilization.

DEDICATION

This dissertation is dedicated to the men and women in uniform who serve our country. I sincerely hope that the findings of this study further increase the visibility of deployment-related mental health concerns and promote help-seeking behaviors among our military personnel.

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TABLE OF CONTENTS

Table of Contents (Continued)

LIST OF TABLES

Table Page

List of Tables (continued)

Table Page

LIST OF FIGURES

Figure Page

CHAPTER ONE

INTRODUCTION

As of 2012, more than 2.2 million service members deployed in support of combat and support operations in Afghanistan and Iraq (Institutes of Medicine, 2013). As many as 70% of U.S. soldiers who deployed in support Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF) may have been exposed to traumatic events (Tenielian & Jaycox, 2008). Further, combat and deployment have been shown to be associated with mental health disorder (Hoge, Auchterlonie, & Milliken, 2006; Hoge, Castro, Messer, McGurk, Cotting, & Coffman, 2004). While the mental health of service members is vitally important for the well-being of the individual, family, unit, and overall readiness, an underutilization of mental health services has been well documented, especially among those in most need of care (Vogt, 2011; Tanielian & Jaycox, 2008; Fikretoglu, Brunet, Guay, & Pedlar, 2007; Hoge et al., 2004). Identifying the determinants that impede or facilitate utilization of mental health services can help increase the understanding of specific enabling resources. Moreover, it can provide opportunities for the development of interventions and policies.

Over the past decade, researchers have examined the determinants of seeking care for mental health problems that may influence a service member's decision to utilize services. While these studies have focused primarly on beliefs and attitudes, stigma, and organizational barriers to care, research of the potential role of marital satisfaction as an

enabling resource is lacking. The current study sought to explore the influence of marital satisfaction on mental health utilization.

Statement of the Problem

OEF and OIF have brought increased attention to the effects of combat on the mental health of military personnel. The protracted combat operations have led to more frequent deployments, extended deployments, and combat exposure, increasing the risk for developing mental health issues (Fikretoglu et al., 2007; Department of Defense Task Force on Mental Health, 2007). Deployment and combat have been strongly associated with mental health disorders, especially Posttraumatic Stress Disorder (PTSD) (Hoge et al., 2006; Hoge et al., 2004).

While the burden of mental disorders is substantial and is associated with attrition, lengthier hospital stays (Wilson, Messer, & Hoge, 2009; Hoge et al., 2002), and decreased relationship satisfaction (Allen, Rhoades, Stanley, & Markman, 2010; Cook, Riggs, Thompson, Coyne, & Sheikh, 2004), the underutilization of mental health services among service members is substantial (Fikretoglu et al., 2007; Tanielian & Jaycox, 2008; Vogt, 2011). While a number of studies have examined the various factors that may impact mental health utilization, the influence of marital satisfaction on treatment-seeking has been largely under examined. To explore this resource and the conditions under which it can deter or facilitate utilization, a quantitative retrospective study was conducted using a matched pre and post-deployment sample of 452 soldiers who participated in the Land Combat Study. The objective of this study was to examine the

various factors that may impact care, more specifically whether marital satisfaction moderated the relationship between barriers to care and utilization and mental health symptoms and utilization.

Context of the Problem

Mental Health Problems in the Military

Deployment and combat experiences have been linked to mental health disorders, impairment in social or employment settings, and increased utilization of mental health services (Hoge et al., 2006; Hoge at al., 2004). The 2011 Department of Defense's (DOD) Health Related Behaviors Survey (HRBS) of active duty personnel, which anonymously gathers data on some of the most important behavioral health issues affecting the well-being of the U.S. military, showed that 20.6% and 13.1% of service members reported combat and non-combat deployments, respectively, with soldiers reporting the highest rates of deployment compared to those in other services (Barlas, Higgins, Pfieger, & Diecker, 2013).

The impact of combat exposure can have lasting impact on the service member's mental health and wellbeing. While PTSD has often been the focus of research and attention, diagnoses such as adjustment, depression, anxiety, and alcohol/substance abuse related disorders have been seen in military populations (Armed Forces Surveillance Branch, 2010). For instance, the prevalence rate of service members who screened positive for PTSD, depression, or PTSD and depression was 19.1% over the course of the administration of the Land Combat Study, which surveyed 22,627 service members

between 2003 and 2009 and 2011 (Quartana et al., 2014). A study that was conducted in the early phase of OEF and OIF found prevalence rates of PTSD, anxiety, and depression to be between 15.6% to 29.2% among service members returning from Iraq and 11.2% to 24.5% among those returning from Afghanistan (Hoge et al., 2004). Further, a study of veterans showed found that 21.8% and 17.4% of OEF and OIF veterans were diagnosed with PTSD and depression, respectively, between 2002 and 2008.

Kim and colleagues (2010) found the overall risk for mental health problems (i.e., "any mental problem" to include depression with serious functional impairment, anxiety with serious functional impairment, PTSD, perceived moderate or severe stress, emotional, alcohol, or family problem, and aggression) among active duty personnel as 45% and 44% at three and 12 months post-deployment. In addition, service members and veterans with mental health disorders have been noted to be at higher risk of suicide (Kang & Bullman, 2013; Kaplan, Huguet, McFarland, & Newsom, 2007; LeardMann et al., 2013).

Timing of Screening

Service members are required to complete the Post-Deployment Health Assessment (PDHA) immediately upon return from a deployment. The PDHA is a review of the service member's current health to include mental health and psychosocial concerns (PDHA; DOD, 2008a). At three to six months post-deployment, service members complete the Post-Deployment Health Reassessment (PDHRA), which provides an opportunity to revisit a service member's health status and to identify symptoms that

may have been missed during PDHA (PDHRA; DOD, 2008b). Both PDHA and PDHRA are self-administered and cover general demographic data, general health, physical symptoms, mental health concerns, and combat exposure.

Screening for mental health problems immediately after returning from deployment may underestimate the prevalence of mental health disorders. The presentation of symptoms may be delayed with persistent or an increase in rates of mental health symptoms that may not be captured in earlier screenings. Negative mental health outcomes, to include interpersonal conflict, PTSD, and depression, increase significantly at PDHRA, suggesting that symptoms may manifest long after a service member returns from deployment (Millilken, Auchterlonie, & Hoge, 2007). Seal and colleagues (2009) found significant increase in the prevalence of mental health diagnoses among veterans following the start of OIF. Veterans who were new to the Department of Veterans Affairs (VA) between 2002 and 2008 showed that 36.9% were given mental health diagnoses. Findings from these studies underscore the lasting impact of deployments and trauma exposure on service members and veterans. They also support the need to identify resources that can facilitate mental health utilization through solidification of social relationships that will likely be sustained long after a service member exits the military.

Attrition from Military Service

Attrition is high among those with mental health disorders and it is estimated that attrition costs the DOD hundreds of millions of dollars each year (U.S. General Accounting Office, 1997). Using data derived from the Defense Medical Surveillance

Systems (DMSS), a database of all military and medical experiences of service members, Hoge and colleagues (2002) found that the 2-year attrition rate of service members hospitalized for mental health disorders to be nearly twice that of individuals hospitalized for other issues. In a similar study, Wilson and colleagues (2009) found that 38.3% of those diagnosed with mental disorders had left the military within one year of initial visit. When V-code diagnoses were included, the 1-year attrition rate was nearly 62%.

Mental Health Service Utilization

Despite a significant number of service members experiencing mental health problems following deployment, less than half of those who screen positive for a mental health problem actually utilize services (Quartana et al., 2014; Gorman, Blow, Ames, & Reed, 2011). Given that symptoms of mental health problems and impact on functioning may not manifest until months and years post-deployment, the underutilization of mental health services is a critical concern (Milliken et al., 2007; Seal et al., 2009).

The various factors that may impact utilization have been well researched, especially the barriers to seeking mental health care (Hoge et al., 2004; Kim, Britt, Klocko, Riviere, & Adler, 2011; Kim, Thomas, Wilk, Castro, & Hoge, 2010). Presumably, the primary reasons for underutilization are negative beliefs and attitudes, stigma, and structural barriers to care. However, the mechanisms through which barriers operate remain under examined, as are conditions under which some factors have the most or least influence.

Policies that Support Access to Mental Health Care

The DOD has made systematic efforts to assess service members post deployment, encourage treatment, and address determinants for seeking care for mental health problems and related issues. These efforts include policies (enabling factor) such as DOD Instructions. For instance, DOD Instruction (DoDI) 6490.08 (Department of Defense, 2011) on "Command Notification Requirements to Dispel Stigma in Providing Mental Health Care to Service Members," specifically states that "healthcare providers shall follow a presumption that they are not to notify a service member's commander when the service member obtains mental health care or substance abuse education services," unless this presumption is overcome by specifically listed requirements (e.g., threat of harm to self, harm to others). Despite these and other efforts, the underutilization of services is significant. Studies have noted that 23% to 40% of those who screened positive for a mental disorder sought mental health care (Hoge et al., 2006; Hoge et al., 2004).

Impact of Mental Health Problems on Marriage

Several studies have shown the negative effect of PTSD symptoms on marital satisfaction and quality within veteran and military populations (Allen et al., 2010; Cook et al., 2004; Riviere, Merrill, Thomas, Wilk, & Bliese, 2012). PTSD is linked to marital dissatisfaction on both the service member and the civilian spouse. In a sample of World War II Prisoners of War, those with PTSD were more likely to report feeling distress in their marriage than those without PTSD (Cook et al., 2004). Demonstrating the profound

impact of PTSD, relationship satisfaction in both soldier and spouse has been most strongly predicted by the soldier's trauma symptoms (Goff, Crow, Reisbig, & Hamilton, 2007) and spouse's marital satisfaction noted to be correlated to the soldier's own report of marital satisfaction (Renshaw, Rodrigues, & Jones, 2008).

The rate of mental health disorders among military spouses are not dissimilar to rates found among service members. In a study of military spouses, when applying the strictest definition of symptoms with functional impairment, nearly 8% screened positive for major depression or generalized anxiety disorder. When defined more broadly based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), 19.5% of military spouses met criteria (Eaton et al., 2008). While military spouses may experience mental health symptoms at similar rates as their service member partners, Eaton and colleagues noted that spouses are more open to seeking help, especially from primary health care sources (2008). This increased willingness to utilize services may be a key element to promoting and facilitating utilization of mental health services by their military spouses through early identification, changes in symptoms, encouragement, and normalization of help-seeking behaviors.

The Role of Social Support in Treatment Seeking

Weiss (1974) proposed that social support consists of six elements: (1) attachments (intimate relationships), (2) social integration (social networks and activities, shared values), (3) reassurance of worth (competence and self-worth), (4) reliability (ability to count on others), (5) guidance (advice) and (6) nurturance (enhanced well-

being). Social support is related to the number of people within the social network and more importantly, the interaction and quality that can either deter or promote treatment seeking. Studies have shown the positive effects of social support on mental health outcomes in military personnel (Sripada et al., 2015; Dinenberg, McCaslin, Bates, & Cohen, 2014). However, the effect of such support appears to be mixed when it comes to mental health utilization. Some studies have found that social support increased mental health initiation and utilization (Harpaz-Rotem, Rosenheck, Pietrzak, & Southwick, 2014; Spoont et al., 2014; Meis, Barry, Kehle, Erbes, & Polusny, 2010). Others studies found that low social support increased mental health utilization (Interian, Kiline, Callahan & Losonczy, 2012; Sayer, Clothier, Spoont, & Nelson, 2007).

These mixed findings seem to indicate that quality of relationships may be a key factor that may help explain and enhance the effect of social support. Not being in a relationship has been shown to increase the risk of developing PTSD (Maguen, Ren, Bosch, Marmar, & Seal, 2010; Pietrzak, Goldstein, Malley, Johnson, & Southwick, 2009). In turn, PTSD symptom severity has been inversely associated with relationship satisfaction (Khaylis, Polusny, Erbes, Gewirtz, & Rath, 2011) and individuals with PTSD who reported higher marital satisfaction were more likely to seek services (Meis et al., 2010). While the quality and closeness of marital relationships may differ amongst couples, spouses can be central to facilitating behaviors that foster the overall wellbeing of service members. Partners who are satisfied with the quality of the relationship can foster behaviors that facilitate help-seeking behaviors that serve as pathways for service members to access care. The effect of exposure to trauma and the subsequent

development of mental health symptoms are dynamic processes that may change over time further providing support that a couple's marital satisfaction may meaningfully contribute to a service member's decision to seek mental health treatment.

Promoting marital satisfaction among active duty personnel and their spouses can yield positive benefits, especially by way of reassurance of worth, guidance or encouragement to seek help, and nurturance. These supportive actions can occur over time and may increase openness to accessing mental health services, especially for service members and veterans experiencing mental health symptoms who may not be emotionally ready for treatment in the immediate months following return from deployment. As a result, examining the mechanisms by which intimate relationships influence utilization can greatly add to the knowledge base.

There are at least two significant contributions that this study sought to make. First, there are few studies that utilize the Behavioral Model of Services Use to explain mental health utilization in the military. This study sought to expand that knowledge base by specifically introducing marital satisfaction as an enabling resource. Second, it sought to determine the role of marital satisfaction in mental health utilization and how it interacted with barriers to care and mental health symptoms to influence utilization.

Theoretical Framework

The Behavioral Model of Health Services Use provides the framework for the literature review. Factors that may deter or facilitate mental health utilization are complex and Andersen's model is leveraged to help predict and explain these factors.

The model suggests that use of health services is influenced by the individual's predisposing, enabling, and need factors (Andersen 1995; Andersen & Davidson, 2001). First, predisposing factors to include demographic variables that are relevant to the examination of service member's use of mental health services is examined. Second, enabling factors to include structural barriers to care, stigma, and marital satisfaction and their role in influencing utilization is reviewed. Third, need factors of PTSD and depression is also reviewed. A brief overview of the predisposing, enabling, and need factors are examined, followed by more detailed analysis of the available literature.

Predisposing characteristics represent a person's proclivity to seek care (e.g., marital status, educational level, age). In addition, general attitudes, values, and knowledge about health and treatment may impact an individual's decision to seek care once the need arises. These beliefs may also impact enabling resources and perceived need.

Enabling factors can increase or decrease the likelihood of service utilization. While services members may have access to military health care benefits, structural issues such as not knowing where to get help, lack of appropriate providers, or difficulty scheduling appointments are factors that may impact care. Additionally, stigma associated with mental health and seeking treatment can also deter help-seeking behaviors. Andersen has proposed that the quality of social relationships can serve to facilitate or deter use of services (Andersen, 1995). Thus, for the purposes of the current paper, marital satisfaction is added to the model as an enabling factor.

Need includes perceived and evaluated needs. Perceived need is the subjective assessment of the severity of symptoms and its impact on functioning. Evaluated need is the objective assessment through professional evaluation. Perceived need has been most strongly linked to utilization while evaluated need is more related to type and length of treatment (Andersen, 1995).

Purpose of the Study

The determinants of seeking care are complex and varied and there are unique challenges with seeking mental health care in the military. Not surprisingly, in a culture that highly prizes the warrior ethos and spirit de corps, seeking help may be perceived as a sign of weakness or a way of letting your peers and leaders down. Identifying and understanding the various factors that can positively influence utilization is critical to promoting a healthy and ready force. The research on determinants of seeking mental health care within the military population has primarily focused on attitudes and beliefs, stigma, and structural concerns. There is a gap in empirical research on the potential viability of marital satisfaction as an enabling resource and the role it plays on the utilization of mental health services. Being in a relationship (i.e., marriage), may or may not be associated with increased utilization of services. Inconsistent findings may, in part, be due to a failure to account for marital satisfaction and quality as potential enabling factors that influence utilization. Therefore, this dissertation examines the role of marital satisfaction in the utilization of mental health services.

The dissertation is structured as follows: (1) review of literature on determinants of seeking mental health care; (2) description of method employed in data analyses; (3) presentation of results; and (4) discussion of key findings as well as the limitations and implications for policy, research, and interventions. The overarching goals of the current study were to examine the factors associated with mental health service utilization among soldiers and to examine marital satisfaction as a moderator of the relationship between barriers to care and utilization and symptoms severity and utilization.

Definition of Terms

Post-Deployment Health Assessment (PDHA) – A comprehensive health screening that reviews a service member's physical and behavioral health concerns associated with deployment 30 days following return from deployment.

Post-Deployment Health Reassessment (PDHRA) – A comprehensive health screening that examines a service member's physical and behavioral health concerns associated with deployment completed 90 to 180 after returning from deployment.

V-codes – Conditions other than a disease or injury that may be a focus of treatment.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents a review of the available literature on determinants that may impact utilization of mental health services and is divided into three primary sections. The first section provides an overview of the theoretical framework used for the study, Andersen's Model of Health Care Utilization. In the second section, Andersen's socio-behavioral model is used to organize the various factors that may be associated with utilization, and the third section focuses on the gaps in current literature.

Search Strategies

The review was conducted electronically using databases provided by Clemson University and was conducted between July and September of 2015. A literature search relevant to understanding the various barriers to care and the role of marital satisfaction on the utilization of mental health services was conducted in four databases: PsycINFO, Medline, SocIndex, and Military & Government. In addition, a search was also conducted in the Military & Government database given the population of interest. Boolean searching was used with marital satisfaction and marital quality in combination with one of the following: utilization; mental health service; mental health treatment; mental health care; barriers to care; determinants of seeking care.

Inclusion and Exclusion Criteria

Studies that were published in languages other than English and non-peer reviewed articles such as editorials, dissertations, and theses were excluded from this review. The search was restricted to articles written in English and published in peer reviewed journals. The search for empirical studies published in the past ten years (2004 to 2014) resulted in 534 in Medline, 1,204 in PsycINFO, 2,061 in SocIndex, and 104 in Military & Government in potentially eligible articles. An additional, limited, search was conducted in April of 2016 for review of current studies. Following application of inclusion and exclusion criteria and guided by the current study, 22 articles from Medline, 47 from PsycINFO, 23 from SocIndex, and 33 from Military & Government were selected. After duplicate articles were excluded, a total of 85 articles were included in this literature review. Of note, some articles were reviewed and used despite their publications falling outside of the search window due to relevance to the current study. Article titles and abstracts along with references were reviewed for relevance and applicability to the current study, a process that added several more studies to the current review.

Determinants of Seeking Care: Predisposing, Enabling, and Need Factors

Andersen's model of health care utilization is a widely used model that helps predict and explain health care use. The model has been adopted and adapted in the mental health literature (Dhingra, Zack, Strine, Pearson, & Balluz, 2010; Fleury, Ngui, Bamvita, Grenier, & Caron, 2014; Vasiliadis, Lesage, Adair, & Boyer, 2005). Published

studies found through this literature search utilized this model with veterans populations (Elhai, Grubaugh, Richardson, Egede, & Creamer, 2008; Elhai, Richardson, & Pedlar, 2007; Maguen et al., 2007). For instance, Elhai and colleagues (2008) used data from the National Survey of Veterans that included 20,048 non-institutionalized veterans to examine mental health utilization while Maguen and others (2007) reviewed utilization among Vietnam veterans. Few studies have used this model to explain the utilization of mental health services in an active duty military population. Application of this model with an active duty force was conducted by Fikretoglu and his team (2002), who used data drawn from the Canadian Community Health Survey-Canadian Forces Supplement conducted in 2002. This study applies the model to examine and explain mental health utilization in an active duty sample in the early stages of OEF and OIF, which are the most enduring conflicts of the modern era.

While need has been most strongly associated with utilization (Maguen et al., 2007), predisposing characteristics and enabling factors have also been shown to be associated with mental health care utilization (Dhingra et al., 2010; Elhai et al., 2007). For the present study, the impacts of predisposing, enabling, and need factors on utilization of mental health services were examined. Further, the potential influence of marital satisfaction on mental health service utilization were explored.

A. Predisposing Characteristics

Predisposing factors are characteristics that can impact an individual's likelihood of seeking care. These characteristics include demographic variables, social structure (e.g., education level, rank, ethnicity), and health beliefs that may contribute to the

utilization of services. Beliefs are attitudes, values, and knowledge individuals hold about mental health and treatment.

Demographic characteristics

A number of demographic characteristics have been found to be associated with utilization. While certain demographic characteristics have consistently been linked with increased utilization, others have been inconsistent. For instance, younger age has been linked to increased risk for PTSD and utilization (Cohen, et al., 2010; Elhai et al., 2006; Seal et al., 2009). Yet, another study showed that younger age is associated with lower rates of utilization and higher treatment dropout rates (Kessler et al., 2001). Similarly, mixed findings exist when it comes to education. Service members with education up to high school had slightly higher odds of utilizing services (Fikletoglu et al., 2008). Using a large community dwelling sample who participated in the Behavioral Risk Factor Surveillance survey, Dhingra and colleagues (2010) found that those with high school education or less had higher odds of utilization than those with more than a high school education. However, in a study of young people with psychosis, higher education was associated with increased utilization (Mattson, 2005).

While female gender has been consistently linked with utilization (Cohen et al., Dhingra et al., 2010; Fikretoglu et al., 2008), the direction of the association varies when it comes to marital status (Babitsch, Gohl, & Lengerke, 2012). One study found that single individuals, whether previously married or never married, were more likely to have received mental health treatment than those who were married (Dhingra et al., 2010).

Other studies found that unmarried women are more likely to delay care than their married counterparts and that married service members are more likely to use services (Fikretoglu et al., 200; Insaf, Jurkowski, & Alomar, 2010). Yet, other studies showed no significant association between marital status and utilization (Elhai, Reeves, & Frueh, 2004; Elhai et al., 2007). Being married may have protective and enabling characteristics. For instance, studies have found that single people are at higher risk of developing PTSD than married individuals (Maguen et al., 2010; Pietrzak et al., 2009). Interestingly but perhaps not surprising is that one study found that divorced, separated, or widowed had the greatest odds of utilization. Fikretoglu et al (2007), suggest that this may be because the loss of a relationship may be a powerful reason to seek help.

Attitudes and Beliefs about Mental Health and Treatment

Attitudes, values, and knowledge about health and services are predisposing factors that can impact the perceived need for services and actual utilization (Andersen, 2008; Andersen, 1995). Negative beliefs or attitudes about mental health problems and treatment may lead individuals to deny or minimize symptoms as well as delay or not seek treatment at all. Alternatively, beliefs and attitudes about one's internal resources as well as social support may also facilitate and promote resources, perceived need, and utilization of services (Andersen, 1995). While stigma and organizational barriers were not predictive of utilization among service members following deployments to Iraq and Afghanistan, those reporting negative attitudes toward treatment were nearly 40% less likely to seek care. In addition, soldiers reporting negative attitudes and beliefs were

found to be the only factor negatively associated with mental health utilization (Kim et al., 2011).

B. Enabling Resources

Over the past several years, researchers have been uncovering the different determinants of seeking mental health care in the military. To date, attitudes and beliefs, stigma, and structural barriers to care have been of particular focus. Stigma and structural barriers to care are explained further below. In addition, marital satisfaction is introduced in this study as a potentially enabling resource such that the quality of a marriage may influence the utilization of mental health services.

Stigma

The concept of stigma as it relates to mental health has been defined or conceptualized as the social-cognitive process that motivates people to avoid the labeling of mental illness that other people associate with mental health care (Corrigan, 2004). Stigma is related to the experiences of service members in response to barriers to seeking mental health care, in addition to attitudes, beliefs, and behaviors of others. Understandably, concerns of stigma are salient among those who screen positive for PTSD (Quartana et al., 2014; Stecker et al., 2013 Hoge, et al., 2004). In a culture that values strength and toughness, seeking help can be seen as a sign of weakness and failure. Moreover, projecting other unit members and leaders' attitudes and beliefs may exacerbate stigma and consequently, negatively impact utilization or intentions of seeking help. The two dimensions of stigma include public and self. Public stigma is

linked to negative attitudes to seeking care. A person who experiences self-stigma is someone who has internalized stereotypes created by the social group or society and applies these to herself or himself (Corrigan, 2004).

Self-stigma was found to be strongly associated with intentions to seek care among National Guard/Reserve service members returning from deployment. More specifically, Blais and Renshaw (2013) found that service members with high level of stigma were less likely to report intention to seek help. Further, Vogel and colleagues (2007) suggested that self-stigma may mediate the relationship between public stigma and attitudes and willingness to seek help for psychological health issues. It is possible that public and self-stigma are influenced by type and quality of social relationships. In the military, the lines between personal and professional lives can be somewhat blurred. The relationship between young soldiers and their leaders, specially, can be very tight. As a result, the level of influence and the type and quality of a relationship may influence stigma. For instance, Britt, Wright, and Moore (2012) found that higher rating of negative noncommissioned officer (NCO) behaviors and lower rating of positive behaviors were associated with higher level of stigma among soldiers had returned from a 15-month deployment to Afghanistan. Therefore, those close to the service member may positively influence utilization by both positive and negative behaviors. In the context of this study it is feasible that spouses can serve as a conduit to promote positive perceptions, beliefs, and behaviors that facilitate the utilization of mental health services.

Structural Barriers to Care

Structural barriers include factors such as lack of availability of trained providers and DOD and service policies that lead to discriminatory or unsupportive treatment. Variables related to structural barriers to seeking mental health care such as "mental health services are not available," "it is difficult to schedule an appointment," and "there would be difficulty getting time off work for treatment," are higher among those reporting a mental health problem than among those who do not. Further, those reporting a mental health problem are two times more likely to cite practical barriers (Kim et al., 2011). While one study found negative attitudes to be associated with decreased utilization, both stigma and structural barriers to care have been noted to be more prominent among those who screen positive for mental health disorders (Kim et al., 2011; Pietrzak et al., 2009).

It is important to note that group differences exist in reported barriers to care. For instance, active duty soldiers are more likely to report difficulty scheduling an appointment and getting time off work for treatment than their National Guard counterparts. Alternatively, soldiers in the National Guard report more concerns over treatment cost than their active duty counterparts (Kim et al., 2010). In a systematic review of the literature, Ramchand and colleagues (2015) found that in addition to stigma, structural barriers such as difficulty scheduling an appointment, getting time off for treatment, and treatment costs were leading barriers to mental health treatment. The authors also found studies that indicated that service members may be accessing help from non-traditional sources such as chaplains.

Marital Satisfaction

Marital satisfaction, that is the quality of the relationship, is proposed to be an enabling factor by Andersen (1995). Reports of relationship dissatisfaction range from 26.2% to 57.8% and nearly 80% report family issues post-deployment (Khaylis et al., 2011; Sayers, Farrow, Ross, & Oslin, 2009). Given that concerns about interpersonal conflicts are significantly higher at PDHRA than at PDHA (Milliken et al., 2007) marital quality and satisfaction may influence service members' wellbeing and openness to considering mental health treatment.

A number of studies (Cook et al., 2004; Dirkzwager, Bramsen, Adèr, & van der Ploeg, 2005; Goff, Crow, Reisbig, & Hamilton, 2007) have found that trauma can have a negative effect on marriage. Further, symptoms severity have been found to be associated with lower marital satisfaction (Allen et al., 2010; Goff et al., 2007; Renshaw et al., 2009) and utilization (Meis et al., 2010). Another relevant study established that utilization increases with greater marital adjustment and satisfaction (Meis et al., 2010). While being married in itself may or may not promote utilization, the quality of the relationship may positively influence use of services. Further, spouses may be central to facilitating help-seeking behaviors given their knowledge of the individual prior to the onset of symptoms and their ability to follow the individual in regression or progression in treatment.

Past studies (Dinenberg et al., 2014; Sripada et al., 2015) have linked social support to positive mental health outcomes. On the other hand, there is a lack of studies

that directly examine the role of social support, specifically intimate relationships, as a potential facilitator to mental health service utilization. The association between social support and utilization has been reported to be bidirectional as the nature and quality of the relationships may either promote or decrease utilization (Sayer, Friedemann-Sanchez, Spoont, Murdoch, Parker, Rosenheck, 2009). In fact, findings on the relationship between social support and mental health service utilization remain ambiguous. Greater social support has been linked to increased mental health initiation and utilization (Harpaz-Rotem et al., 2014; Spoont et al., 2014; Meis et al., 2010) and alternatively, low social support has been shown to be related to increased mental health utilization (Interian et al., 2012; Sayer et al., 2007). Further, in a study that examined the perceived influence of family on recovery from mental illness, Aldersey and Whitley (2014) found that family can both hinder and facilitate the recovery process. While family can promote recovery through moral support, practical support, and motivation, family can also hinder recovery by serving as a stressor, demonstrating stigma and lack of understanding, and forcing treatment. Similarly, a study of veterans enrolled in an outpatient Trauma Recovery Program at a VA medical center showed that most expressed interest in family involvement in treatment (Batten et al., 2009). The highest source of perceived support comes from spouses, demonstrating the important role they can play in facilitating access and adherence to mental health care (Batten et al., 2009; Renshaw et al., 2009). Marital satisfaction, therefore, can be a critical enabling factor that can positively influence help-seeking behaviors and successful recovery.

In comparison to predisposing or need factors, enabling factors are suggested to have a higher degree of mutability by Andersen, (1995). The current study proposes that marital satisfaction is an enabling resource that can influence outcomes (i.e., utilization).

C. Need Factors

Individuals in high stress occupations are at higher risk of developing mental health problems and with as many as 70% of soldiers who deployed in support of OEF and OIF having potentially been exposed to traumatic events with concerns about mental health problems is high (Britt & McFadden, 2012; Tenielian & Jaycox, 2008; Vogt, 2011). Consequently, mental health problems among soldiers and veterans are some of the most enduring negative sequelae of combat-related trauma. Symptom severity (Sayer et al., 2007) and perceived need (Spoont et al., 2014) have also been associated with greater mental health service utilization.

A number of studies have shown that prevalence of mental health symptoms is high among service members, especially among those with combat exposure (e.g., Quartana et al., 2014, Hoge et al., 2006). With over half of 45,338 service members who participated in the 2011 Health Related Behavior Survey, which used a stratified random sample that surveyed members across all branches, reporting combat exposure, the number of people affected is vast (Barlas et al., 2013). Further, findings from studies using LCS data shows PTSD prevalence rates that ranged from 12.2% to 19.9% among service members who deployed to Iraq and 6.2% to 11.5% among those who deployed to Afghanistan (Hoge et al., 2004). Depression rates have been found to be between 7.1%

and 15.2% among service members who deployed to Iraq and 6.9% and 14.2% among those who deployed to Afghanistan. In a study that examined mental health prevalence rates at two different time points, immediately following deployment and three to six months post-deployment, revealed an increase for all conditions. For instance, PTSD rates increased from 10.3% to 16.7% and depression from 4.7% to 11.8% (Milliken et al., 2007).

Despite the significant prevalence of mental health problems within the military, underutilization is a critical concern. Utilization over the course of the administration of LCS, which drew from a large sample of 21,795 active duty soldiers and had a completion rate of 59%, rates ranged from 19.8% in 2003 to 25.9% in 2009, peaking at 42.1% in 2007. When it was administered again in 2011, the rate of 35.8% was higher than any other year between 2003 and 2009, except for 2007 (Quartana et al., 2014). Further, mental health problems have been associated with multiple negative consequences to include attrition from military service, increased utilization of services (Wilson et al., 2009; Hoge et al., 2006), lengthier hospital stays (Hoge et al., 2002) and relationship dissatisfaction (Allen et al., 2010; Cook et al., 2004). Deployment and combat exposure has vast implications to the wellbeing of the individual and family and consequently the overall operational readiness of the military. While much can be done to promote the psychological health protection and resilience of the force prior to deployment, exposure to trauma in times of war is inevitable. Military and VA leaders can promote a culture of normalizing help-seeking behaviors by leveraging social

supports. Thus the present study focuses on factors that can potentially facilitate utilization, especially the satisfaction and quality of marriages.

Present Study

Identifying factors that facilitate and deter utilization of services for mental health issues is central to normalizing and promoting help seeking behaviors. The majority of the studies reviewed focused on determinants of care, specifically beliefs and attitudes and beliefs, stigma, and structural barriers to care. Several studies examined predictors of utilization, some through the use of Andersen's sociobehavioral model. Studies that examined the predictors of utilization focused on demographic and social structure factors, perceived social support, and need factors (Elhai et al., 2007; Fleury et al., 2014; Sripada et al., 2015). While it is important to understand the determinants of seeking care at the individual level, it is even more critical to examine how the quality of social relationships, especially intimate relationships, can negatively or positively influence these behaviors.

The direction of association between demographic factors and utilization has been mixed. Therefore, the direction of the relationship between demographic variables in this study is not specified. When it comes to marriages, being married may or may not be associated with increased utilization, not being in a relationship appears to put the individual at a higher risk of developing PTSD (Maguen et al., 2010; Pietrzak et al., 2009). PTSD symptom severity has also been found to be inversely associated with relationship satisfaction (Khaylis et al., 2011). Importantly, one study found that

individuals with PTSD who reported higher marital adjustment were more likely to seek mental health services (Meis et al., 2010). Given the equivocal findings found in the literature regarding the relationship between social support and mental health service utilization, the current study introduces marital satisfaction as an enabling factor within Andersen's model and examines whether marital satisfaction moderates the relationship between barriers to care and utilization and mental health symptoms and utilization.

How marital satisfaction interacts with predisposing, enabling, and need factors to influence utilization is largely unknown. Research on whether marital satisfaction can facilitate or deter utilization, and the role it plays on the utilization among soldiers with varying degrees of mental health needs is scarce. Presumably, a good marriage can serve to lower utilization rates by mitigating symptom severity, that is, by serving as a buffer. Alternatively, it may facilitate mental health utilization by normalizing and encouraging help-seeking. Figures 2.1. and 2.2. show models of how marital satisfaction is hypothesized to moderate the relationship between barriers to care utilization and mental health symptoms and mental health service utilization, respectively. While marital status is proposed to be associated with utilization, marital satisfaction is hypothesized to enable utilization after controlling for mental health problems (i.e., PTSD and depression).

Figure 2.1.

Marital satisfaction as moderator between barriers to care and utilization

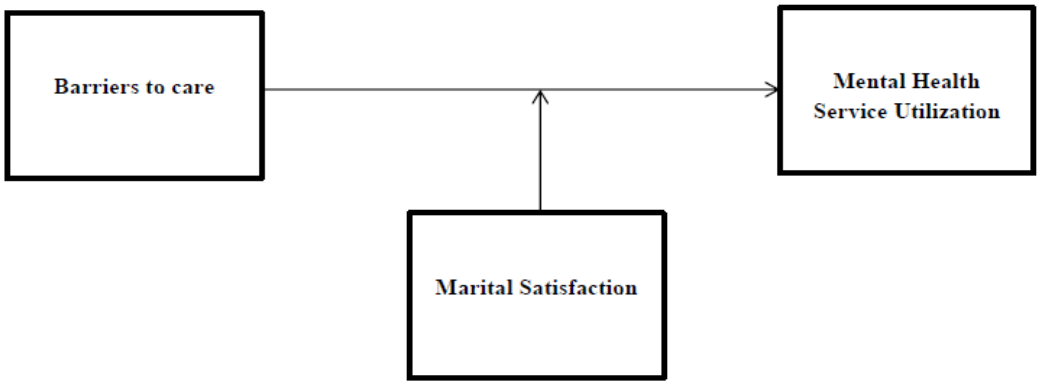
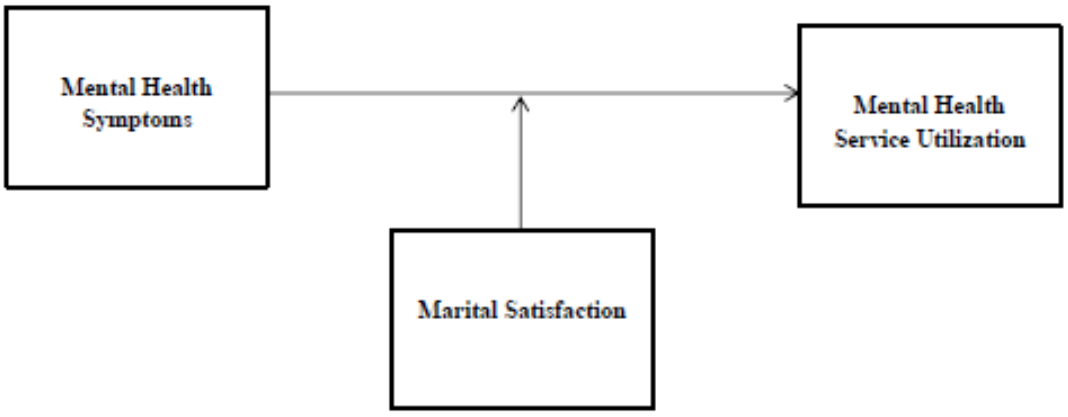


Figure 2.2.

Marital satisfaction as moderator between mental health symptoms and utilization



The present study focuses on the potential role of marital satisfaction as a moderator. Having a marriage with high satisfaction levels allows for open communication, involvement, encouragement, and motivation in a supportive manner. More importantly, it may help soldiers overcome perceived barriers to care to facilitate utilization of services. The importance of assessing moderators for those at high risk for exposure to trauma has been suggested by researchers (Britt, Adler, Bliese, & Moore, 2013; Bacharach & Bamberger, 2007). Therefore, the present study aims to examine the factors that are associated with mental health utilization and examine marital satisfaction as moderator of the: 1) relationship between barriers to care and mental health utilization; and 2) relationship between mental health symptoms and mental health utilization. All research questions cover both time periods.

Research Questions and Hypotheses. The following research questions and hypotheses guided the examination of the potential role that marital satisfaction can have on utilization of mental health services:

Research Question 1: What factors are significantly associated with utilization of mental health services?

Hypothesis 1.1: Age, gender, marital status, rank, education, and beliefs and attitudes (predisposing factors) are significantly associated with utilization.

Hypothesis 1.2: Stigma, structural barriers to care, and marital satisfaction (enabling factors) are significantly associated with utilization.

Hypothesis 1.3: Mental health symptoms (need factor) are significantly associated with utilization.

Research Question 2. Does marital status moderate the relationship between barriers to care and mental health service utilization?

Hypothesis 2.1a. Marital status influences the relationship between attitudes and beliefs and utilization at Time 1.

Hypothesis 2.1b. Marital status influences the relationship between attitudes and beliefs and utilization Time 2.

Hypothesis 2.2a. Marital status influences the relationship between structural barriers and utilization at Time 1.

Hypothesis 2.2b. Marital status influences the relationship between structural barriers and utilization at Time 2.

Hypothesis 2.3a. Marital status influences the relationship stigma and utilization at Time 1.

Hypothesis 2.3b. Marital status influences the relationship stigma and utilization at Time 2.

Research Question 3. Does marital satisfaction moderate the relationship between barriers to care and mental health service utilization?

3.1a. Marital satisfaction influences the relationship between attitudes and beliefs and utilization at Time 1.

3.1b. Marital satisfaction influences the relationship between attitudes and beliefs and utilization at Time 2.

3.2a. Marital satisfaction influences the relationship between structural barriers and utilization at Time 1.

3.2b. Marital satisfaction influences the relationship between structural barriers and utilization at Time 2.

Research Question 4. Does marital satisfaction moderate the effect of PTSD and depression symptom severity on mental health service utilization?

4.1a. Marital satisfaction influences the relationship between PTSD and utilization at Time 1.

4.1b. Marital satisfaction influences the relationship between PTSD and utilization at Time 2.

4.2a. Marital satisfaction influences the relationship between depression and utilization at Time 1.

4.2b. Marital satisfaction influences the relationship between depression and utilization at Time 2.

CHAPTER THREE

METHODS

Study Design and Data Collection

The present is a retrospective study that used data collected as part of a larger study titled, the Land Combat Study (LCS). The LCS was administered annually between 2003 and 2009 and in 2011 (N = 22,627) (Quartana et al., 2014). The LCS is a cross-sectional study that provided anonymous surveys to services members at the pre-deployment period and at different time points post-deployment. The data used in the current study was collected between 2003 and 2004 among soldiers who deployed to Iraq.

Participants

The sample consisted of active duty soldiers who completed the WRAIR Well-Being Survey as part of the LCS before and three months after deployment. The sample consisted of 452 soldiers who had matched data from pre-deployment period (Time 1, n = 2,530) and post deployment period (Time 2, n = 1,585). Clemson University's Institutional Review Board reviewed the study and determined that it qualified as non-human subjects research as it did not involve either intervention or interaction with living individuals, or the collection of identifiable private information (please see Appendix A for copy of determination letter).

Measures

The survey (please see Appendix B for questions of the Well-Being Survey applicable to this study), disseminated as part of the LCS, covered several domains to assess the impact of combat on the mental health and wellbeing of service members. This study involved the analysis of an existing dataset. Several scales were adapted and adopted from various existing survey instruments and are further detailed below. Of note, the barriers to care instrument consists of thirteen items taken from Hoge and colleagues and organized based on Andersen's model: (1) predisposing: two items on attitudes and beliefs about mental health and treatment, (2) enabling: six items on stigma and five items on structural barriers to care (2004). Marital satisfaction was included as an enabling resource for the purposes of this study and need factor was examined through the review of PTSD and depression symptoms as shown in Table 3.1.

Table 3.1.

Independent, Moderating, and Outcome Variables

Independent Variables	Moderating Variable	Outcome Variable
Predisposing Characteristics	*Enabling Factor*	Mental health utilization
Age	Marital satisfaction	
Gender		
Race		
Education level		
Grade/Rank		
Marital status		
Attitudes and Beliefs		
Enabling Factors		
Stigma		
Structural Barriers		
Need Factors		
PTSD		
Depression		

Independent Variables

A. Predisposing Factors

1. **Age**. Age was measured in five categories: 1 = 18 to 20, 2 = 20-24, 3 = 25-29, 4 = 30-39, and 5 = 40 or older.

2. **Gender**. Gender was coded as 1 = male and 2 = female.

3. **Race.** Race is measured in five categories: 1 = Caucasian/White, 2 = African American, 3 = Hispanic, 4 = Asian/Pacific Islander, 5 = Other.

4. **Education Level.** Education is measured in five categories: 1 = some high school, 2 = GED, 3 = high school diploma, 4 = college graduate, 5 = other.

5. **Grade/Rank.** Rank is measured in six categories: 1 = E1 – E4, 2 = E5 – E6, 3 = E7 – E9, 4 = O1 – O3, 5 = O4 – O9, and 6 = WO1 – WO5. Abbreviations include E (Enlisted), O (Officer), and W (Warrant Officer).

6. **Marital Status.** Marital status were re-coded as 1 = single never married, 2 = married, 3 = other, including separated and divorced.

7. **Attitudes and Beliefs.** Two items were used to measure attitudes and beliefs about mental health and treatment. These items included, "I don't trust mental health professionals and "mental health doesn't work." Responses to items were on a Likert-type scale from *strongly disagree* to *strongly agree.*

B. Enabling Factors

1. **Stigma.** Six items were used to measure stigma. These items included, "It would be too embarrassing," "It would harm my career," "members of my unit might have less confidence in me," "my unit leadership might treat me differently," "my leaders would blame me for the problem," and "I would be seen as weak." Participants rated their level of agreement with each items, 1 = *strongly disagree* to 5 = *strongly disagree.* The Cronbach's alpha prior to for both Times 1 and 2 were .95, indicating high internal consistency.

2. **Structural Barriers to Care.** Five items were used to measure structural barriers to care. Items included, "I don't know where to get help," "I don't have adequate transportation," "it is difficult to schedule an appointment," and "there would be difficulty getting time off work for treatment," and "mental health costs too much money." Responses to items were on a Likert-type scale from 1 = *strongly disagree* to 5 = *strongly agree.* The Cronbach's alpha at Times 1 and 2 were .85 and .86, respectively.

3. **Marital Satisfaction (Moderating Variable)**. Four of the nine items used to measure marital satisfaction were included in the present study as they were part of the Quality of Marriage Index (QMI) (Norton, 1983). Participants were asked to rate 1 to 5 from *strongly disagree* to *strongly agree* to the following statements: "I have a good marriage," "my relationship with my spouse is very stable," "my relationship with my spouse makes me happy," and "I really feel like part of a

team with my spouse." Cronbach's α of the four items Time1 was .98 and .97 at Time 2. A sum of the scale, with higher scores representing higher marital satisfaction, was used to measure marital satisfaction.

C. Need Factors

1. **Posttraumatic Stress Disorder**. The PTSD Checklist (PCL) was used to assess for symptoms of PTSD. Participants were asked to answer 17 items in reference to experiences following deployment or in response to other stressful life events on a 5-item scale, 1 = *not at all*, 2 = *a little bit*, 3 = *moderately*, 4 = *quite a bit*, and 5 = *extremely*. The PCL includes clusters of symptoms related to intrusion (Criterion B), avoidance/numbing (Criterion C), and hyperarousal (Criterion D) as outlined on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (American Psychiatric Association, 1994). The composite score ranged from 17 to 85. Soldiers who scored 50 or above and reported "moderate" symptoms (ratings of 3 or higher on the 5-point scale) for at least one intrusion symptom, three avoidance/numbing symptoms, and two hyperarousal symptoms were considered to have PTSD (Cook, Riggs, Thompson, Coyne, & Sheikh, 2004; Hoge et al., 2004; Kim, Britt, Klocko, Riviere, & Adler, 2011; Riggs, Byrne, Weathers, & Litz, 1998). The PCL has been widely used in studies of service members (Kim et al., 2011; Hoge et al., 2004). The Cronbach's alpha was .94 for both time periods, suggesting high internal consistency.

2. **Depression.** The current study measured depression symptoms using the Patient Health Questionnaire (PHQ-9) a subset of the Patient Health Questionnaire. The PHQ-9 is a nine item depression scale that covers symptoms such as sleep problems and feeling bad about oneself (Spitzer, Kroenke, & Williams, 1999). Participants were asked, "over the past 4 weeks, how often have you been bothered by any of the following problems?" The response scale include 1 = *not at all*, 2 = *few or several days*, 3 = *more than half the days*, and 4 = *nearly every day*. Soldiers who reported experiencing five or more symptoms more than half the days and either having "little interest or pleasure in doing things" or "feeling down, depressed, or hopeless" more than half the days in the past four weeks were considered to be depressed. The sum of the nine items were calculated for each time period and probable depressive disorder was determined by a score of $\geq$10 (Kroenke, Spitzer, Williams, & Lowe, 2010; Wittkampf, Naeije, Schene, Hyyser, & van Weert, 2007). The PHQ-9 has been found to have good internal and test-retest reliability in addition to helping establish the diagnosis of depression and gauge severity of symptoms (Kroenke, Spitzer, & Williams, 2001). The Cronbach's alpha for this study were .88 and .91 at Time 1 and Time 2, respectively. Table 3.2. shows the reliability of the scales and subscales used in this study.

Table 3.2.

Reliability of scales

Measure	Number of items	Time 1	Time 2
Marital satisfaction	4	.98	.97
Barriers to care	13	.94	.94
Attitudes and Beliefs	2	.80	.74
Structural	5	.85	.86
Stigma	6	.95	.95
PCL (PTSD)	17	.94	.94
PHQ 9 (Depression)	9	.88	.91

Outcome Variable

Mental Health Service Utilization. The utilization of services was assessed by asking whether participants received mental health services for a stress, emotional, alcohol, or family problem from a mental health professional, chaplain, or medical doctor in either military or civilian settings in the past 12 months in Times 1 and 2. Consistent with other LCS studies, participants who reported having accessed at least one of these professionals and settings were categorized as having utilized mental health care (Hoge et al., 2010; Kim et al., 2011; Kim et al., 2010).

Data Analytic Approach

The current study explored the patterns and predictors of mental health utilization among soldiers and examined the combined influence of marital satisfaction and barriers to care on mental health utilization, controlling for mental health symptoms severity. The data from the study was analyzed with the Statistical Package for the Social Sciences

(SPSS) program version 23.0. As shown on table 3.3, the data analyses were conducted in two discrete phases, 1) data preparation, screening, and cleaning and 2) main analyses as presented below. Analyses included frequency and descriptive statistics, chi-square tests, correlation tests, and logistic regressions. Table 3.3. below shows the research questions and hypotheses.

Table 3.3.

Research questions and associated hypotheses

Data Cleaning and Preparation

Research Question	Hypothesis	Analytical Approach
Do Marital Satisfaction and Barriers to Care measures demonstrate acceptable factorial validity and reliability for examining marital satisfaction and barriers to care among military personnel?	These subscales show factorial validity and reliability for examining marital satisfaction barriers to care among military personnel.	Factor Analyses

Main Hypotheses Testing

Research Question	Hypothesis	Analytical Approach
1. What factors are significantly associated with utilization of mental health services?	**1.** Age, gender, marital status, rank, and beliefs and attitudes (predisposing factors) are significantly associated with utilization.	Chi-square
	2. Stigma, structural barriers to care, and marital satisfaction (enabling factors) are significantly associated with utilization.	Correlation
	3. Mental health symptoms (need factor) are significantly associated with utilization.	Chi-square

2.	Does marital status moderate the relationship between barriers to care and mental health service utilization?	2.1a. Marital status influences the relationship between attitudes and beliefs and utilization at Time 1. 2.1b. Marital status influences the relationship between attitudes and beliefs and utilization Time 2. 2.2a. Marital status influences the relationship between structural barriers and utilization at Time 1. 2.2b. Marital status influences the relationship between structural barriers and utilization at Time 2. 2.3a. Marital status influences the relationship stigma and utilization at Time 1. 2.3b. Marital status influences the relationship stigma and utilization at Time 2.	Hierarchical Logistic regressions
3.	Does marital satisfaction moderate the relationship between barriers to care and mental health service utilization?	3.1a. Marital satisfaction influences the relationship between attitudes and beliefs and utilization at Time 1. 3.1b. Marital satisfaction influences the relationship between attitudes and beliefs and utilization Time 2. 3.2a. Marital satisfaction influences the relationship between structural barriers and utilization at Time 1. 3.2b. Marital satisfaction influences the relationship between structural barriers and utilization Time 2.	Hierarchical Logistic regressions

		3.3a. Marital satisfaction influences the relationship stigma and utilization at Time 1. 3.3b. Marital satisfaction influences the relationship between stigma and utilization at Time 2.	
4.	Does marital satisfaction moderate the effect of PTSD and depression symptom severity on mental health service utilization?	4.1a. Marital satisfaction influences the relationship between PTSD and utilization at Time 1. 4.1b. Marital satisfaction influences the relationship between PTSD and utilization at Time 2. 4.2a. Marital satisfaction influences the relationship between depression and utilization at Time 1. 4.2b. Marital satisfaction influences the relationship between depression and utilization at Time 2.	Hierarchical Logistic regressions

Data Set Preparation, Screening, and Cleaning

The screening process involved data cleaning, exploratory factor analyses, confirmatory factor analyses, and reliability analyses to determine the psychometric properties of the scales. Prior to conducting the main analyses, descriptive statistics were generated and frequency distributions of study variables examined. Data were screened for outliers. Central tendency and dispersion were reviewed to identify errors in coding and missing values. Exploratory factor analyses of the Barriers to Care scale at Time 1 and Time 2 guided the identification of the underlying relationships between variables. This step was critical as it informed the formation of three barriers to care subscales, attitudes and beliefs about mental health and treatment, structural barriers to care, and stigma. Confirmatory Factor Analyses were conducted for the marital satisfaction scale at Time 1 and Time 2 to examine latent structure of the measure and identify the variables that load on different factors.

Research Question 1. What factors are significantly associated with utilization of mental health services?

Chi-square analyses and correlations were conducted to address research question 1 that examine the bivariate associations between utilization and different factors. Depending on the types of variables, Pearson correlation or chi-square tests were used to establish results. Associations were examined without specification of direction given the mixed findings of demographic variables and their association with utilization found in the literature review.

Research Question 2. Does marital status moderate the relationship between barriers to care and mental health service utilization?

Research Question 3. Does marital satisfaction moderate the relationship between barriers to care and mental health service utilization?

Research Question 4. Does marital satisfaction moderate the effect of PTSD and depression symptom severity on mental health service utilization?

Research questions 2, 3, and 4 were tested with hierarchical logistic regressions, where predictors were entered in separate blocks, followed by interaction terms that tested the role of marital status and marital satisfaction as moderators. Research questions 2 and 3 were controlled for PTSD and depression. Continuous predictors were mean-centered prior to being included in the analysis and prior to creating an interaction term. Significant interactions were further decoded with simple effects tests.

CHAPTER 4

RESULTS

This chapter presents descriptive analyses and main findings of this study. It summarizes the demographic characteristics of the sample, factor analyses of both marital satisfaction and barriers to care instruments, and provides the results of the main hypotheses analyses.

Characteristics of the Sample

The sample consisted of primarily young, junior enlisted (73.5%), Caucasian/White (78.5%), male soldiers (99.6%) with three or fewer years of marriage and military service. Nearly 90% of the sample was under the age of 29 with over 69% being under the age of 24. The overwhelming majority of the participants were male and less than 1% of the sample was female. Of the entire sample of 452, approximately half were single (n = 251), nearly a third married (n = 142), the rest reported being separated or divorced (n = 35) prior to deployment. The rate of single soldiers went down slightly from 55.5% at Time 1 to 49.8% at Time 2 while the rate of divorced or separated went down to nearly half post-deployment (7.7% to 3.5%). Of those married, 26.1% to 28.3% were married less than 4 years. Less than 1% reported being married for more than 16 years. The education profile between the two time periods changed. While over three quarters reported having a high school degree or less at Time 1, this rate decreased to 57.7% at Time 2 and the rate of those reporting to have some college education increased from 11.7% to 40.9%. Only 2.5% reported having over 16 years of military

service while the majority reported having been in the military for less than three years, which is consistent with rank distribution noted in the sample as seen in Table 4.1.

Table 4.1.

Demographic characteristics of the sample (N = 452)

Demographic Characteristic	Time 1		Time 2	
	n	%	*n*	%
Age				
18 – 24	329	72.8	312	69.0
25 – 29	77	17.0	89	19.7
30 – 39	43	9.5	59	10.8
40 or older	1	0.2	2	0.4
Gender				
Male	450	99.6	449	99.3
Female	2	0.4	3	0.7
Marital status				
Single	251	55.5	225	49.8
Married	142	31.4	157	34.7
Separated/Divorced/Other	35	7.7	16	3.5
Years of current marriage				
1 – 4	128	28.3	118	26.1
5 – 10	27	6.0	34	7.5
11 – 15	18	4.0	14	3.1
16 – 20	2	0.4	4	0.9
20 or more	0	0.0	1	0.2
Race/Ethnicity				
Caucasian/White	355	78.5	357	79.0
African American	21	4.6	18	4.0
Hispanic	42	9.3	39	8.6
Asian/Pacific Islander	15	3.3	15	3.3
Other	13	2.9	17	3.8
Education				
High school graduate or less	356	78.8	261	57.7
College graduate or less	53	11.7	185	40.9
Other	38	8.4	4	0.9
Military grade				
E1 – E4	332	73.5	294	65.0
E5 – E6	86	19.0	126	27.9

E7 – E9	10	2.2	12	2.7
O1 – O9 (Officer)	23	5.1	18	4.0
WO1 – WO5	0	0.0	1	0.2
Years in the military				
0 – 3	325	71.9	312	69.0
4 – 7	69	15.3	79	17.5
8 – 11	28	6.2	34	7.5
12 – 15	18	4.0	14	3.1
16 – 20	9	2.0	11	2.4
21 or more	2	0.4	1	0.2

Mental Health Service Utilization

Of 452 soldiers, 8.61% reported using mental health services at Time 1 and 14.89% at Time 2. Marital status was found to be associated with mental health utilization at both time periods, $\chi^2(2) = 15.36$, $p = .001$ and $\chi^2(2) = 9.25$, $p = .010$. Mental health service utilization rates were similar at Time 1 among married and single soldiers. At Time 2, utilization rate among single soldiers and married soldiers were 35% and 43.3%, respectively. Among married soldiers who used mental health services, the mean marital satisfaction score was 3.53 (SD = 1.53) at Time 1 and 3.37 at Time 2 (SD = 1.28). The mean marital satisfaction score among those who did not seek services was higher than among those who sought mental health care.

Table 4.2. Mental health service utilization rates

Variable		Time 1 (n = 418)				Time 2 (n = 403)			
		No MH Utilization		MH Utilization		No MH Utilization		MH Utilization	
		382		36		343		60	
		n	%	*n*	%	*N*	%	*n*	%
Marital status	Single	227	59.42	14	38.9	196	57.1	21	35.0
	Married	123	32.20	13	36.1	106	30.9	26	43.3
	Other	26	6.8	9	25.0	26	7.6	8	13.3
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Marital satisfaction		4.14	1.05	3.53	1.53	3.92	1.15	3.37	1.28

As shown in Table 4.3., eleven soldiers, five single and four married, screened positive for depression and reported utilizing services at Time 1. Of those married, three had marital satisfaction scores above the mean (M = 3.75, SD = 3.11). Specifically, at Time 1, the mean marital satisfaction score for those who screened positive for depression and utilized mental health services was 3.75 (SD = 1.31) and the mean marital satisfaction among those who screened positive for depression but did not utilize services was 3.23 (SD = 1.21). Among soldiers who did not screen positive for depression but utilized services, the mean martial satisfaction score was 3.63 (SD = 1.54). At Time 2, of the 22 soldiers who screened positive for depression and used services, 9 were single and 8 were married. Of those married, four reported marital satisfaction score above the mean (M = 3.12, SD = 1.25). Among those who screened positive for depression at Time 2, the

mean marital satisfaction score was 3.78 (*SD* = 1.30) for those who utilized services and 3.12 (*SD* = 1.25) for those who did not. The mean marital satisfaction score was 3.48 (*SD* = 1.34) among soldiers who did not screen positive for depression but utilized services.

At Time 1, two soldiers, one married and one single, who screened positive for PTSD utilized mental health services. At Time 2, the differences in utilization within this subsample are clearer. Of the14 soldiers who screened positive for PTSD and utilized services, four were single and seven were married. Among married soldiers, the mean marital satisfaction score for those who screened positive for PTSD and utilized mental health services was 3.00 (*SD* = 1.20) and among those who did not utilize services, 3.71 (*SD* = 1.25). Significance tests could not be conducted given the low percentages and these percentages should be interpreted with caution due to low cell counts.

Table 4.3.

Utilization rates among soldiers screening positive for PTSD or depression

Variable		Time 1				Time 2			
		Depression and MH Utilization		PTSD and MH Utilization		Depression and MH Utilization		PTSD and MH Utilization	
		11		2		22		9	
		n	%	*n*	*%*	*n*	%	*n*	%
Marital status	Single	5	45.5	1	50.0	9	36.0	4	25.0
	Married	4	36.4	1	50.0	8	32.0	7	43.8
	Other	2	18.2	0	0.0	5	13.3	3	18.8
Marital satisfaction		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
		3.75	1.31	--	--	3.12	1.25	3.0	1.20

PTSD Symptoms

In addition to reviewing the overall mental health treatment utilization rates, rates of soldiers who screened positive for PTSD and depression and utilized services were examined separately. PTSD was found to be significantly associated with mental health utilization at Time 2, $\chi^2(2) = 7.19$, $p = .007$, but not at Time 1. Three quarters of those who screened positive for PTSD did not seeking mental health care. As expected, the mean PCL score ($M = 24.96$, $SD = 11.22$) at Time 1 was lower than at Time 2 ($M = 34.68$, $SD = 14.90$). Among the subsample of soldiers who screened positive for PTSD at Time 1 ($n = 16$), 12.5% sought treatment. The rate of soldiers seeking mental health treatment who also screened positive for PTSD ($n = 61$) doubled to 26.23% at Time 2. While single soldiers were more likely to seek services at Time 1, utilization was higher among married soldiers than single soldiers at Time 2. Table 4.4. shows soldiers who screened positive for PTSD and those who did not and their respective utilization rates.

Table 4.4.

Prevalence of PTSD

Variable		Time 1 (n = 400)				Time 2 (n = 420)			
		No PTSD 363		PTSD 16		No PTSD 350		PTSD 70	
		n	%	*n*	%	*N*	%	*n*	%
Mental health utilization	No	332	86.9	14	77.8	278	79.4	45	64.3
	Yes	31	8.1	2	11.1	41	11.7	16	22.9
Marital status	Single	211	55.2	10	55.6	189	54.0	21	30.0
	Married	125	32.7	4	22.2	101	28.9	28	40.0
	Other	33	8.6	1	5.6	25	7.1	9	12.9
Marital satisfaction	Low	19	5.0	1	5.6	15	4.3	9	12.9
	Hi	125	32.7	4	22.2	108	30.9	25	35.7

Depression Symptoms

Depression was significantly associated with mental health utilization at both time periods, $\chi^2(1) = 7.93$, $p = .005$ and $\chi^2(1)) = 10.68$, $p = .001$ with only 22.3% of those who screened positive for depression seeking mental health services. The mean score for depression at Time 2 was higher ($M = 7.09$, $SD = 6.27$) than at Time 1 ($M = 5.34$, $SD = 5.26$). Table 4.5. shows that at Time 1 ($n = 63$), 15.5% of soldiers screened positive for depression and Time 2, the percentage of soldiers scoring 10 or above on the PHQ-9 increased to 25.9%. Underutilization of mental health services was also noted among the subsample of soldiers who screened positive for depression as it was seen among those who reported high symptoms of PTSD. Similar to findings related to PTSD, soldiers with higher level of marital satisfaction were more likely to seek mental health treatment at both time periods than those who reported low level of marital satisfaction.

Table 4.5.

Prevalence of depression

		Time 1 (n = 439)				Time 2 (n = 432)			
		No Depression		Depression		No Depression		Depression	
		371		68		320		112	
		n	%	*n*	%	*N*	%	*n*	%
Mental Health	No	330	88.9	52	76.5	264	82.5	78	69.6
Utilization	Yes	24	6.5	11	16.2	33	10.3	25	22.3
Marital status	Single	206	55.5	44	64.7	166	51.9	56	50.0
	Married	126	34.0	16	23.5	103	32.2	33	29.5
	Other	28	7.5	6	8.8	24	7.5	12	10.7
Marital	Low	14	3.8	5	7.4	15	4.7	11	9.8
satisfaction	Hi	129	34.8	16	23.5	107	33.4	30	26.8

Of note, a pattern of missing items were noted for several variables, especially related to barriers to care and marital satisfaction measures, suggesting that missing values may be related to a systematic process (McKnight & McKnight, 2011). Missing data related to marital satisfaction was associated with marital status with single soldiers not responding to this question. Missing data related to barriers to care appeared to be associated with people not reporting mental health concerns. Thus, in order to conduct the Confirmatory Factor Analysis of the Barriers to Care instrument, all cases with missing values were excluded. A modified sample consisting of only married soldiers was used for research questions 3 and 4 as both questions specifically focus on marital satisfaction.

Hypotheses Testing

Research question: Do Marital Satisfaction and Barriers to Care measures demonstrate acceptable factorial validity and reliability for examining marital satisfaction and barriers to care among military personnel?

Hypothesis: These scales show factorial validity and reliability for examining marital satisfaction and barriers to care among military personnel.

Thirteen items that made up the Barriers to Care instrument were factor analyzed, separately at Time 1 and Time 2. To test the hypothesis about the structure of latent variables and their relationships to each other, Confirmatory Factor Analysis was conducted for the Barriers to Care instrument at Time 1 (see Table 4.6). Similarly,

Confirmatory Factor Analyses were conducted to test the hypothesis about the structure and fit of the marital satisfaction measure.

Exploratory Factor Analyses

Exploratory Factor Analyses were conducted on the 13 items related to barriers to care with Maximum Likelihood extraction method and Promax with Kaiser Normalization rotation. The Kaiser-Meyer-Olkin (KMO) and Bartlett's test for sampling adequacy were significant and the communalities for each variable were sufficiently high at both Time 1 and Time 2 (all above .40 and most above .60) indicating that the variables were adequately correlated for a factor analysis. Costello and Osborne suggested that a factor with five or more items with loadings of .50 or better is considered to be robust and a factor with less than three items as weak and unstable (2005). There were several items that loaded in two or all three factors, however, each of those items loaded in at least one factor at .50 or higher. Finally, the pattern matrix was examined for factor loading and the factor correlation for correlation between factors (see Table 4.2).

At Time 1, three factors had eigenvalues over Kaiser's criterion of 1. The scree plot showed inflections that supported retaining three factors. Six items that loaded robustly in Factor 1 represent stigma, five items that loaded in Factor 2 represent structural barriers to care, and two items that loaded in Factor 3 represent attitudes and beliefs. While only two items loaded in Factor 3, scales with one or more factors may be identified with as few as two items (Raubenheimer, 2004). At Time 2, only two factors

had eigenvalues over 1. As in Time 1, many items loaded into both factors. Seven items loaded in Factor 1 and six in Factor 2.

Confirmatory Factor Analyses

Confirmatory Factor Analyses were conducted using EQS 6 Structural Equations Program to test whether measures of marital satisfaction and barriers to care were consistent with the nature of the measures utilized. Comparative Fit Index (CFI>.95), Bentler-Bonnett index/nonnormed fit index (NNFI> .95), and Root Mean Square Error of Approximation (RMSEA<.06) for categorical data were used to determine model fit (Schreiber, Stage, King, Nora, & Barlow, 2006; Sivo, Fan, Witta, & Willse, 2006; Hu & Bentler, 1999). For marital satisfaction at Time 1, chi-square value for the model fit was not significant $\chi^2(2) = 3.05$, $p = .218$ but other indices represented a good fit CFI = .99, NNFI = .99, RMSEA = .058 (see Table 4.3). As Schreiber and colleagues suggested, if the majority of the indices indicate a good fit, then the model is likely a good fit (2006). All items loaded significantly into the single factor with loadings ranging from .95 to .96. For marital satisfaction at Time 2, chi-square value for the model fit was significant $\chi^2(2) = 6.85$, $p = .032$ and results for CFI = .99, NNFI = .99, and RMSEA = .12. The items loaded well into the single factor with loading ranging from .94 to .95. Results should be interpreted with caution as the chi-square value was not significant at Time 1 but all other indices were appropriate. At Time 2, while chi-square was significant, RMSEA was above the recommended level of .06.

Confirmatory Factor Analysis for the barriers to care instrument was conducted at Time 1 only as Time 2 EFA resulted in a different factor solution (see Table 4.2). Chi-square for the model was significant $\chi^2(48) = 143.40$, $p = < .001$ with adequate fit indices to include CFI = .98, NNFI = .99, and RMSEA = .06 (see table 4.2). Cronbach's α for these items was .93.

Table 4.6.

Model fit indices for Confirmatory Factor Analyses and reliability scales

Factor	χ^2	*df*	*p*	NNFI	CFI	RMSEA	Cronbach's α
Marital Satisfaction (Time 1)	3.05	2	.218	.99	.99	.06	.98
Marital Satisfaction (Time 2)	6.85	2	.032	.99	.99	.12	.97
Barriers to Care (Time 1)	143.40	48	.000	.96	.98	.06	.93

Main Hypotheses Testing

Research Question 1: What factors are significantly associated with utilization of mental health services?

Hypothesis 1.1. Age, marital status, rank, education, and attitudes and beliefs (predisposing factors) are significantly associated with utilization.

Chi-square tests were conducted between predisposing factors and utilization. Tests produced mixed results, with varying results between the two time periods and some demographic variables. Only education at Time 2 and marital status at both time periods were found to be associated with mental health service utilization. Specifically,

age, rank, and the level of attitudes and beliefs were not found to be significantly associated with utilization. As shown in Table 4.7., chi-square test revealed a significant relationship between education and utilization at Time 2, $\chi^2(2, n = 402) = 8.26$, $p = .016$. There was a weak statistically association between education and utilization, $\varphi_c = .14$, $p = .016$. Specifically, the rate of utilization was higher among those with college education or degree (.21) than those with a high school education only (.14). Given the low counts in the "other" category of the education variable, the analyses only examined those with high school education and college education or less. Overall, the odds of utilizing mental health services were 1.5 times higher if the soldier had a college degree or some college education.

Marital status was found to be associated with utilization and Time 1 $\chi^2(2, n = 412) = 15.36$, $p = .001$ with a moderate association between marital status and utilization, $\varphi_c = .21$, $p = .001$. Specifically, the rate of utilization was slightly higher for those who were married (.11) than for those who were single (.06). Surprisingly, the highest rate of utilization was among those who reported being divorced, separated, or widowed (.30). Given that the count for the "other" category (i.e., divorces/separated) was small, the results were only interpreted in more detail for the other two categories, where counts were higher. Overall, the odds of utilizing mental health services were 1.6 times higher for those who were married in comparison to those were single. Marital status was also associated with utilization at Time 2 $\chi^2(2, n = 383) = 9.25$, $p = .010$. There was a weak association between marital status and utilization, $\varphi_c = .19$, $p = < .001$. Specifically, the rate of utilization was higher for those who were married (.20) than for those who were

single (.10). Overall, the odds of utilizing mental health services among those who were married were almost twice the odds of those who were single.

Table 4.7.
Association between predisposing factors and utilization

Variable	Time 1			Time 2		
	χ^2	*df*	*p* value	χ^2	*df*	*p* value
Education	.66	2	.720	8.26	2	.016
Marital status	15.36	2	< .001	9.25	2	.010

Hypothesis 1.2. Stigma, practical barriers to care, and marital satisfaction (enabling factors) are significantly associated with utilization.

Pearson's product-moment correlations were run to assess the association between utilization and the three types of enabling factors: (a) structural barriers to care and utilization, (b) stigma and utilization, and (c) marital satisfaction and utilization. Structural barriers to care were found to have weak statistically non-significant correlation to utilization at Time 1, $r = .09$ and at Time 2, $r = .08$. Similarly, weak correlations were found between stigma utilization at Time 1, $r = .10$ and Time 2, $r = .11$, significant at .05 level. Marital satisfaction was found to have weak negative correlations at Time 1, $r = -.18$, and Time 2, $r = -.18$, significant at .05 level.

Hypothesis 1.3. Mental health symptoms (need factor) are significantly associated with utilization.

Chi-square tests were conducted to examine the association between PTSD and utilization and depression and utilization at both time periods. Results produced mixed findings. A significant association was found at Time 2, $\chi^2(1) = 7.19$, $p = .007$ between PTSD and mental health service utilization but not at Time 1. However, the same association was not significant at Time 1. The strength of the significant association was moderate, $\varphi_c = .14$, $p = .011$. Specifically, the rate of utilization was higher among soldiers who screened positive for PTSD (.26) than among those who did not (.13). Overall, the odds of mental health service utilization among those who screened positive for PTSD were 2.4 times the odds of utilization among those who did not screen positive for PTSD.

Significant associations between depression and utilization were found at both time periods. At Time 1, a significant moderate association was found between depression and utilization, $\chi^2(1) = 7.93$, $\varphi_c = .14$, $p < .05$ with a moderate association. Specifically, the rate of utilization was higher among those who screened positive for depression (.17) than for those who did not (.07). Overall, the odds of utilizing services among those who screened positive for depression were almost three times the odds of those who did not screen positive. Similarly, a significant association was found between depression and utilization at Time 2, $\chi^2(1) = 10.68$, $p = .001$ with moderate association between higher level of depression and utilization, $\varphi_c = .16$, $p = .001$. More specifically,

the rate of utilization was higher among those screening positive for depression (.25) than those who did not (.11). The overall odds of utilization among soldiers who screened positive for depression were 2.6 times higher than those who did not screen positive for depression.

Table 4.8.

Association between need factors and utilization

Variable	Time 1			Time 2		
	χ^2	*df*	*p* value	χ^2	*df*	*p* value
PTSD	.30	1	.640	7.19	1	.007
Depression	7.93	1	.005	10.68	1	.001

Research Question 2: Does marital status moderate the relationship between barriers to care and mental health service utilization?

Hierarchical logistic regressions were conducted to examine whether marital status influenced the relationship between the three aspects of barriers to care and utilization at both time periods while controlling for PTSD and depression. Continuous predictors were centered prior to being entered in the model and marital status was collapsed into a three-category variable with single soldiers as the comparison group.

Hypothesis 2.1a. Marital status influences the relationship between attitudes and beliefs and utilization at Time 1.

To examine whether marital status moderated the relationship between attitudes and beliefs about mental health and treatment and mental health service utilization at

Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by attitudes and beliefs and marital status in the second block. Table 4.9. presents the results of the analysis. The interaction term of attitudes and beliefs and marital status were entered in the third block. The logistic regression model was significant, $\chi^2(7) = 20.78$, $p = .004$. The model explained 12.8% (Nagelkerke R^2) of the variance in mental health utilization and correctly classified 91.2% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data.

Overall, the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 10.73$, $p < .05$. Further analysis of the effect of marital status on utilization revealed that that the odds of mental health service utilization increased by a factor of 5.17 among divorced soldiers in comparison to those who reported being single. The average predicted probability of utilizing service among those who reported being divorced was .233. Surprisingly, the comparison between single and married was not significant. The mean predicted probability of mental health service utilization was .063 among single soldiers and .094 among married soldiers. Interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between attitudes and utilization. Thus the hypothesis was not supported.

Table 4.9.

Logistic regression model of marital status and attitudes at Time 1

Predictor		B	S.E.	Wald χ^2	*Df*	*p*	OR
Block 1	PTSD	.01	.02	.45	1	.501	1.01
	Depression	.06	.04	2.14	1	.144	1.07
Block 2	PTSD	.01	.02	.11	1	.744	1.01
	Depression	.07	.04	2.61	1	.106	1.08
	Marital status (divorced)	1.64	.54	9.26	1	.002	5.17
	Marital status (married)	.78	.54	2.78	1	.095	2.17
	Attitudes	-.50	.29	2.90	1	.089	1.65
Block 3	Marital status (divorced) x attitudes	-.1.32	1.00	1.73	1	.188	.27
	Marital status (married) x attitudes	.03	.64	.002	1	.962	1.03

	Test	χ^2	*Df*	*p*
	Model χ^2	20.78	7	.004
	Goodness of fit	5.34	8	.720

Predicted Probabilities	Divorced	Married	Single
	.233	.094	.063

Hypothesis 2.1b. Marital status influences the relationship between attitudes and beliefs and utilization at Time 1.

To examine whether marital status moderated the relationship between attitudes and beliefs about mental health and treatment and mental health service utilization at Time 2, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by attitudes and beliefs and marital status in the second block. The interaction term of attitudes and beliefs and marital status were entered in the third block. The logistic regression model was significant, $\chi^2(7) = 18.78$, p

= .009. The model explained 10 % (Nagelkerke R^2) of the variance in mental health service utilization and correctly classified 86.4% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data. Overall, the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 6.23$, $p < .05$. Further investigation of the effect of marital status showed that in comparison with single soldiers, those who reported being divorced or married had a higher likelihood of utilizing mental health services. Specifically, the odds of utilizing mental health services increased by 2.23 among married soldiers and by 2.91 among divorced. The predicted probabilities of utilization were .088 among single, .181 among married, and .241 for divorced soldiers. The interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between attitudes about mental health and treatment and utilization. Thus the hypothesis was not supported.

Table 4.10.

Logistic regression model of status and attitudes at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.02	.01	1.75	1	.185	1.02
	Depression	.04	.04	1.24	1	.266	1.04
Block 2	PTSD	.01	.01	.59	1	.443	1.01
	Depression	.06	.04	2.48	1	.115	1.06
	Marital status (divorced)	1.07	.53	4.05	1	.044	2.91
	Marital status (married)	.82	.37	4.89	1	.027	2.23
	Attitudes	-.06	.21	.07	1	.787	.94
Block 3	Marital status (divorced) x attitudes	.02	.58	.00	1	.973	1.02
	Marital status (married) x attitudes	-.19	.45	.18	1	.672	.83

	Test	χ^2	*df*	*p*
	Model χ^2	18.78	7	.009
	Goodness of fit	6.52	8	.589

Predicted Probabilities	Divorced	Married	Single
	.241	.181	.088

Hypothesis 2.2a. Marital status influences the relationship between structural barriers and utilization at Time 1.

To examine whether marital status moderated the relationship between structural barriers to care and mental health treatment utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers and marital status in the second block. The interaction term of structural barriers and marital status were entered in the third block. The logistic

regression model was significant, $\chi^2(7) = 22.69$, p = .002. The model explained 13.9 % (Nagelkerke R^2) of the variance in mental health service utilization and correctly classified 91.2% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data. Overall the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 10.85$, $p < .05$. Further analysis of the effect of marital status on utilization showed that the odds of mental health service utilization increased by a factor of 5.48 among divorced soldiers in comparison to single soldiers. The average predicted probability of utilization among those who reported being divorced was .063 among single, .093 among married, and .233 for divorced soldiers. Interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between structural barriers to care and utilization. Thus the hypothesis was not supported.

Table 4.11.

Logistic regression model of marital status and structural barriers at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.01	.02	.45	1	.500	1.01
	Depression	.06	.04	2.11	1	.146	1.07
Block 2	PTSD	.01	.02	.25	1	.615	1.01
	Depression	.06	.05	1.46	1	.226	1.06
	Marital status (divorced)	1.70	.54	9.86	1	.002	5.48
	Marital status (married)	.61	.44	1.91	1	.167	1.84
	Structural barriers	.47	.26	3.25	1	.070	1.60
Block 3	Marital status (divorced) x structural barriers	-1.20	.72	2.77	1	.096	.30
	Marital status (married) x structural barriers	-.82	.57	2.11	1	.146	.44

	Test	χ^2	*df*	*p*
	Model χ^2	22.69	7	.002
	Goodness of fit	2.84	8	.944

Predicted Probabilities	Divorced	Married	Single
	.233	.093	.063

Hypothesis 2.2b. Marital status influences the relationship between structural barriers and utilization at Time 2.

To examine whether marital status moderated the relationship between structural barriers to care and mental health treatment utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers and marital status in the second block. The interaction term of structural barriers and marital status were entered in the third block. The logistic

regression model was significant, $\chi^2(7) = 21.15$ p = .004. The model explained 11.2 % (Nagelkerke R^2) of the variance in mental health service utilization and correctly classified 86.9% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data. Overall, the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 7.93$, $p < .05$. Further investigation of the effect of marital status showed that, in comparison with single soldiers, those who reported being divorced or married had a higher likelihood of utilization mental health services. Specifically, the odds of utilization increased by 3.29 among divorced soldiers and 2.55 among married soldiers. The predicted probabilities of utilization were .088 among single, .181 among married, and .241 among divorced soldiers. As in Time 1, the interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between structural barriers to care and utilization at Time 2. Thus the hypothesis was not supported.

Table 4.12.

Logistic regression model of marital status and structural barriers at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.02	.01	1.75	1	.185	1.02
	Depression	.04	.04	1.24	1	.266	1.04
Block 2	PTSD	.01	.01	.49	1	.483	1.01
	Depression	.04	.04	1.64	1	.200	1.05
	Marital status (divorced)	1.19	.53	5.10	1	.024	3.29
	Marital status (married)	.94	.37	6.36	1	.012	2.55
	Structural barriers	.28	.21	1.78	1	.182	1.32
Block 3	Marital status (divorced) x structural barriers	-.26	.58	.20	1	.655	.77
	Marital status (married) x structural barriers	-.41	.45	.83	1	.363	.66
	Test			χ^2	*df*	*p*	
	Model χ^2			21.15	7	.004	
	Goodness of fit			7.20	8	.515	
Predicted Probabilities		Divorced		Married		Single	
		.241		.181		.088	

Hypothesis 2.3a. Marital status influences the relationship stigma and utilization at Time 1.

To examine whether marital status moderated the relationship between structural barriers to care and mental health treatment utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers and marital status in the second block. The interaction term of

structural barriers and marital status were entered in the third block. The logistic regression model was significant, $\chi^2(7) = 19.94$ p = .006. The model explained 12.3 % (Nagelkerke R^2) of the variance in mental health service utilization and correctly classified 92.1% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data.

Overall, the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 10.17$, $p < .05$. Further investigation of the effect of marital status showed that, in comparison with single soldiers, those who reported being divorced or married had a higher likelihood of utilization mental health services. Specifically, the odds of utilization increased by 4.92 among divorced soldiers and 1.77 among married soldiers. The predicted probabilities of utilization were .063 among single, .094 among married, and .233 for divorced soldiers. The interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between stigma and utilization. Thus the hypothesis was not supported.

Table 4.13.

Logistic regression model of marital status and stigma predicting utilization at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.01	.02	.49	1	.484	1.01
	Depression	.06	.04	2.04	1	.154	1.06
Block 2	PTSD	.01	.02	.24	1	.611	1.01
	Depression	.06	.05	1.96	1	.161	1.07
	Marital status (divorced)	1.59	.54	8.86	1	.003	4.92
	Marital status (married)	.57	.44	1.71	1	.191	1.77
	Stigma	.19	.20	.84	1	.358	1.21
Block 3	Marital status (divorced) x Stigma	-.94	.52	3.21	1	.071	.392
	Marital status (married) x stigma	-.35	.445	.63	1	.526	.702

	Test	χ^2	*df*	*p*
	Model χ^2	19.94	7	.006
	Goodness of fit	8.05	8	.429

Predicted Probabilities	Divorced	Married	Single
	.233	.094	.063

Hypothesis 2.3b. Marital status influences the relationship stigma and utilization at Time 2.

To examine whether marital status moderated the relationship between structural barriers to care and mental health treatment utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers and marital status in the second block. The interaction term of

structural barriers and marital status were entered in the third block. The logistic regression model was significant, $\chi^2(7) = 23.33$ p = .001. The model explained 12.3% (Nagelkerke R^2) of the variance in mental health service utilization and correctly classified 86.5% of the cases. Hosmer and Lemeshow test was not statistically significant, indicating that the model was a good fit for the data.

Overall, the model showed that marital status was a significant predictor of utilization, Wald $\chi^2(2) = 8.20$, $p < .05$. Further investigation of the effect of marital status showed that, in comparison with single soldiers, those who reported being divorced or married had a higher likelihood of utilization mental health services. Specifically, the odds of utilization increased by 3.24 among divorced soldiers and 2.48 among married soldiers. The predicted probabilities of utilization were .089 among single, .183 among married, and .241 for divorced soldiers. Similar to the previous findings in Time 1, the interaction term was not significant, indicating that marital status had no statistically significant influence on the relationship between stigma and utilization. Thus the hypothesis was not supported.

Table 4.14.

Logistic regression model of status and stigma predicting utilization at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.02	.01	1.97	1	.161	1.02
	Depression	.04	.04	.99	1	.321	1.04
Block 2	PTSD	.01	.02	.78	1	.376	1.01
	Depression	.03	.04	.72	1	.395	1.03
	Marital status (divorced)	1.17	.52	5.00	1	.025	3.24
	Marital status (married)	.91	.36	6.21	1	.013	2.48
	Stigma	.32	.17	3.49	1	.062	1.37
Block 3	Marital status (divorced) x Stigma	-.27	.47	.33	1	.566	.76
	Marital status (married) x stigma	-.38	.37	1.07	1	.300	.685
	Test			χ^2	*df*	*p*	
	Model χ^2			23.33	7	.001	
	Goodness of fit			11.25	8	.188	
Predicted Probabilities		Divorced		Married		Single	
		.241		.183		.089	

Research Question 3: Does marital satisfaction moderate the relationship between barriers to care and mental health service utilization?

Hierarchical logistic regressions were conducted to examine whether marital satisfaction influenced the relationship between the three aspects of barriers to care and utilization at both time periods while controlling for PTSD and depression. Continuous predictors were centered prior to being entered in the model.

Hypothesis 3.1a. Marital satisfaction influences the relationship between attitudes and beliefs about mental health and utilization at Time 1.

To examine whether marital satisfaction moderated the relationship between attitudes and beliefs about mental health and treatment and utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by attitudes and beliefs and marital satisfaction in the second block. The interaction term of attitudes and beliefs and marital satisfaction were entered in the third block. The model was not significant, although the Hosmer and Lemeshow test showed that the model was a good fit for the data. As shown on table 4.10., neither main effects nor the interaction term were significant.

Table 4.15.
Logistic regression model of marital satisfaction and attitudes at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.03	1.14	1	.285	1.03
	Depression	.01	.07	.12	1	.725	1.02
Block 2	PTSD	.03	.03	.81	1	.368	1.03
	Depression	.01	.07	.02	1	.893	1.01
	Marital satisfaction	-.23	.24	.93	1	.334	.79
	Attitudes	.43	.45	.93	1	.335	1.50
Block 3	Marital satisfaction x attitudes	-.08	.08	.96	1	.327	.92

	Test	χ^2	*df*	*P*
	Model χ^2	6.93	5	.226
	Goodness of fit	13.36	8	.100

Hypothesis 3.1b. Marital satisfaction influences the relationship between attitudes and beliefs about mental health and utilization at Time 2.

To examine whether marital satisfaction moderated the relationship between attitudes and beliefs about mental health and treatment and utilization at Time 2, the same procedure was followed as in hypothesis 3.1a. The model was not significant, although the Hosmer and Lemeshow test showed that the model was a good fit for the data. As shown on table 4.11. Neither predictors nor the interaction term were significant.

Table 4.16.

Logistic regression model of marital satisfaction and attitudes at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.02	1.89	1	.170	1.03
	Depression	.02	.05	.13	1	.716	1.03
Block 2	PTSD	.03	.02	2.13	1	.144	1.08
	Depression	.01	.05	.05	1	.830	1.13
	Marital satisfaction	-.28	.18	2.26	1	.133	1.09
	Attitudes	-.38	.32	1.41	1	.234	1.28
Block 3	Marital satisfaction x attitudes	-.01	.08	.01	1	.915	.99
	Test			χ^2	*df*	*p*	
	Model χ^2			9.84	5	.080	
	Goodness of fit			2.73	8	.950	

Hypothesis 3.2a. Marital satisfaction influences the relationship between structural barriers and utilization at Time 1.

To examine whether marital satisfaction moderated the relationship between structural barriers to care and utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers to care and marital satisfaction in the second block. The interaction term of structural barriers to care and marital satisfaction were entered in the third block. The overall model was not significant and the Hosmer and Lemeshow test showed that the model was a good fit for the data. As shown in table 4.12., neither predictors nor the interaction model were significant.

Table 4.17.

Logistic regression model of marital satisfaction and structural barriers at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.02	.03	.67	1	.414	1.03
	Depression	.04	.07	.28	1	.596	1.04
Block 2	PTSD	.04	.03	1.10	1	.294	1.04
	Depression	.01	.07	.02	1	.889	1.01
	Marital satisfaction	-.43	.24	3.39	1	.066	.65
	Structural barriers	.32	.41	.62	1	.429	.72
Block 3	Marital satisfaction x Structural barriers	.08	.05	2.42	1	.120	1.08
	Test			χ^2	*df*	*p*	
	Model χ^2			9.08	5	.106	
	Goodness of fit			8.91	8	.359	

Hypothesis 3.2b. Marital satisfaction influences the relationship between structural barriers and utilization at Time 2.

To examine whether marital satisfaction moderated the relationship between structural barriers to care and utilization at Time 2, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by structural barriers to care and marital satisfaction in the second block. The interaction term of structural barriers to care and marital satisfaction were entered in the third block. The overall model was not significant and the Hosmer and Lemeshow test showed that the model was a good fit for the data. As shown on table 4.13., neither predictors nor the interaction model were significant.

Table 4.18.

Logistic regression model of marital satisfaction and structural barriers at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.02	2.43	1	.119	1.03
	Depression	.02	.05	.12	1	.729	1.02
Block 2	PTSD	.03	.02	2.50	1	.114	1.03
	Depression	.00	.05	.00	1	.962	1.00
	Marital satisfaction	-.28	.18	2.32	1	.127	.76
	Structural barriers	.09	.29	.10	1	.756	1.09
Block 3	Marital satisfaction x Structural barriers	-.02	.04	.16	1	.688	.98

	Test	χ^2	*df*	*p*
	Model χ^2	9.93	5	.077
	Goodness of fit	5.63	8	.689

Hypothesis 3.3a. Marital satisfaction influences the relationship between stigma and utilization at Time 1.

To examine whether marital satisfaction moderated the relationship between stigma and utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by stigma and marital satisfaction in the second block. The interaction term of stigma and marital satisfaction were entered in the third block. The model was not significant and the Hosmer and Lemeshow test showed that the model was a good fit for the data. As shown on table 4.14., neither predictors nor the interaction model were significant.

Table 4.19.

Logistic regression model of marital satisfaction and stigma at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.03	1.18	1	.277	1.03
	Depression	.03	.07	.16	1	.691	1.03
Block 2	PTSD	.04	.03	1.44	1	.229	1.04
	Depression	.00	.07	.00	1	.959	1.00
	Marital satisfaction	-.32	.23	1.92	1	.166	.73
	Stigma	-.12	.29	.18	1	.668	.88
Block 3	Marital satisfaction x stigma	.13	.19	.47	1	.494	1.14

	Test	χ^2	*df*	*P*
	Model χ^2	5.84	5	.322
	Goodness of fit	4.53	8	.807

Hypothesis 3.3b. Marital satisfaction influences the relationship between stigma and utilization at Time 2.

To examine whether marital satisfaction moderated the relationship between stigma and utilization at Time 2, a hierarchical logistic regression was conducted. PTSD and depression were entered in the first block, followed by stigma and marital satisfaction in the second block. The interaction term of stigma and marital satisfaction were entered in the third block. The model was not significant and the Hosmer and Lemeshow test did not show that the model was a good fit for the data. As shown on table 4.15., neither predictors nor the interaction model were significant.

Table 4.20.

Logistic regression model of marital satisfaction and stigma at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.02	2.21	1	.137	1.03
	Depression	.01	.05	.05	1	.823	1.01
Block 2	PTSD	.04	.02	2.72	1	.099	1.04
	Depression	-.03	.06	.23	1	.628	.97
	Marital satisfaction	-.23	.18	1.61	1	.205	.79
	Stigma	.30	.23	1.73	1	.188	1.35
Block 3	Marital satisfaction x stigma	-.04	.14	.094	1	.759	.96
	Test			χ^2	*df*	*p*	
	Model χ^2			10.01	5	.075	
	Goodness of fit			3.06	8	.931	

Research Question 4: Does marital satisfaction moderate the effect of PTSD and depression symptom severity on mental health service utilization?

Hypothesis 4.1a. Marital satisfaction influences the relationship between PTSD and utilization at Time 1.

To examine whether marital satisfaction moderated the relationship between PTSD and utilization at Time 1, a hierarchical logistic regression was conducted. PTSD and marital satisfaction were entered in the first block, followed by an interaction term in a separate block. As seen in table 4.16., of the two predictors only PTSD was found to predict utilization. The main effect of PTSD indicated that the odds of mental health utilization increased slightly with greater levels of PTSD symptoms. The interaction of PTSD and marital satisfaction was not found to be significant. The overall model was found to be statistically significant $\chi^2(3) = 9.06$, $p = .028$, and a good fit for the data. The model explained 12.1% of the variance (Nagelkerke R^2) in utilization.

Table 4.21. Logistic regression model of marital satisfaction and PTSD at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.04	.02	3.90	1	.048	1.04
	Marital satisfaction	-.38	.21	3.20	1	.074	.68
Block 2	PTSD x Marital satisfaction	.01	.02	.72	1	.395	1.01
	Test			χ^2	*df*	*p*	
	Model χ^2			9.06	3	.028	
	Goodness of fit			4.86	7	.677	

Hypothesis 4.1b. Marital satisfaction influences the relationship between PTSD and utilization at Time 2.

The logistic regression model was statistically significant, $\chi^2(3) = 11.27$, $p = .010$. The model explained 11.3% of the variance (Nagelkerke R^2) in utilization and it was a

good fit for the data. Of the two predictors, only PTSD was found to be a weak but significant predictor of utilization.

Table 4.22.

Logistic regression model of marital satisfaction and PTSD at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	PTSD	.03	.01	7.03	1	.008	1.03
	Marital satisfaction	-.26	.17	2.37	1	.124	.77
Block 2	PTSD x Marital satisfaction	.01	.01	.42	1	.517	1.01

	Test	χ^2	*df*	*p*
	Model χ^2	11.27	3	.010
	Goodness of fit	8.55	8	.382

Hypothesis 4.2a. Marital satisfaction influences the relationship between depression and utilization at Time 1.

To examine whether marital satisfaction moderated the relationship between depression and utilization, a hierarchical logistic regression was conducted. Depression and marital satisfaction were entered in the first block, followed by an interaction term in a separate block. As in previous models, continuous predictors were centered prior to being entered in the model. As shown in Table 4.15, the model was a good fit for the data and was statistically significant, $\chi^2(3) = 20.30$, $p = .001$. The model correctly identified 90.5% cases belonging in one of the two utilization groups. Both predictors and the interaction term were statistically significant. Importantly, the predictors remained significant after adding the interaction term in the second step, indicating that utilization

of mental health services is influenced by independent and combined influences of depression and marital satisfaction as shown on table 4.23.

Table 4.23.

Logistic regression model of marital satisfaction and depression at Time 1

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	Depression	2.00	.722	7.70	1	.006	2.17
	Marital satisfaction	-.97	.34	8.08	1	.004	.38
Block 2	Depression x Marital satisfaction	1.59	.61	6.85	1	.009	4.88
	Test			χ^2	*df*	*p*	
	Model χ^2			20.30	3	<.001	
	Goodness of fit			3.60	7	.824	

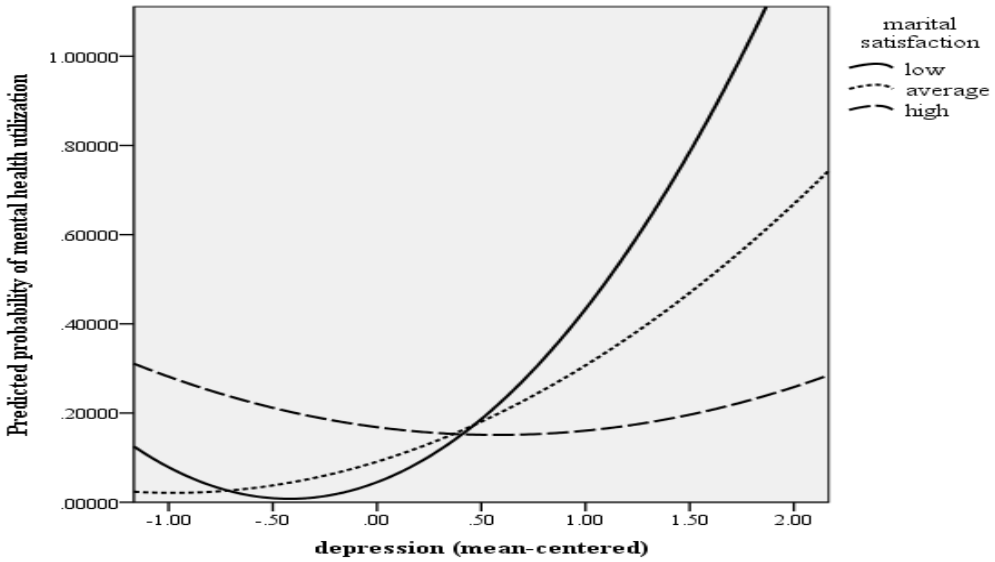
To illustrate the effect of moderation, probing of simple effects was carried out, using Hayes PROCESS module (2013). Additionally, conditional predicted probabilities were calculated for different values of the hypothesized moderator. Specifically, three values of the marital satisfaction measure were used to show the effect of depression on utilization: (a) low (one standard deviation below the mean), (b) average, and (c) high (one standard deviation above the mean). Table 4.24. presents probabilities for low and high levels of the moderator.

Table 4.24.

Predicted probabilities of utilization with marital satisfaction as moderator

Values of the independent variable (Depression)	Values of the moderator (Marital Satisfaction)	Predicted probabilities
High (.416)	High (.930)	.11
	Low (-.760)	.17
Low (-.613)	High (.930)	.003
	Low (-.760)	.08

The moderating influence of marital satisfaction on the relationship between depression and utilization is presented in Figure 4.1. Simple effects test showed that depression increased the likelihood of utilizing mental health services but only among those who reported low levels of marital satisfaction. At the low levels of marital satisfaction, the association between depression and utilization was weak and non-significant. Figure 4.1.Interaction between marital satisfaction and depression to predict mental health utilization



Hypothesis 4.2b. Marital satisfaction influences the relationship between depression and utilization at Time 2.

The overall model was not statistically significant and neither predictors nor the interaction were significant. The results did not support the initial hypothesis.

Table 4.25.

Logistic regression model of marital satisfaction and depression predicting utilization at Time 2

Predictor		B	S.E.	Wald χ^2	*df*	*p*	OR
Block 1	Depression	.06	.03	3.16	1	.075	1.06
	Marital satisfaction	-.30	.17	3.15	1	.076	.74
Block 2	Depression x Marital satisfaction	.01	.02	.27	1	.602	1.01
	Test			χ^2	*df*	*p*	
	Model χ^2			7.70	3	.053	
	Goodness of fit			9.26	8	.321	

Summary

This chapter presented the main findings of the study. The analyses for this study examined mental health service utilization based on marital status and marital satisfaction. Chi-square analyses demonstrated that mental health service utilization was significantly associated with education and PTSD post-deployment and marital status and depression at both time periods. Higher education, beyond high school, increased the odds of mental health service utilization. PTSD and depression were found to be significantly associated with mental health service utilization, especially at post-

deployment period. Pearson correlations showed that stigma was weakly correlated to mental health service utilization at both time periods as was marital satisfaction.

Contrary to initial hypotheses, the three aspects of barriers to care did not interact with marital status or marital satisfaction to predict mental health services utilization. Marital status was found to be a predictor of utilization. Overall, the odds and predicted probabilities of mental health service use were highest among divorced, followed by married then single soldiers. While PTSD was a predictor of utilization at both time periods, depression predicted utilization at pre-deployment only. Depression and marital satisfaction independently and jointly predicted mental health utilization prior to deployment with increase in utilization observed among soldiers with lower level of marital satisfaction.

CHAPTER 5

DISCUSSION

This chapter summarizes and discusses the findings presented in the previous chapter and includes limitations as well as implications and recommendations for research, policy, and practice.

The Behavioral Model of Health Services Use classifies marital status as a predisposing characteristic and social support as an enabling factor. Social support, an indicator of social integration, has been found to be linked to positive mental health outcomes (Sripada at al., 2015; Dinenberg et al., 2014). Based on Andersen's framework (1995), marital satisfaction was proposed to be an enabling resource in this study. Andersen has suggested that mutability is an important factor in promoting access and that certain enabling variables have a higher degree of mutability.

This study's findings indicate that divorced soldiers have the highest odds of utilizing mental health services followed by married soldiers. Supporting past findings (Interian et al., 2012; Maguen et al., 2007; Sayer et al., 2007), both PTSD and depression (pre-deployment only) (i.e., need factors) were predictors of mental health service utilization. This is consistent with Andersen's suggestion that need is the strongest predictor of utilization. Somewhat surprising were the findings that neither marital status nor marital satisfaction, which was proposed to be an enabling resource in this study, moderated the relationship between barriers to care and mental health service utilization. In fact, marital satisfaction was found to only moderate the relationship between

depression and mental health service utilization prior to deployment. Interestingly, the moderating effect indicated that utilization increase among soldiers with lower marital satisfaction. Although unexpected, this finding is not contradictory to the bidirectional associations found between social support and mental health utilization (Harpaz-Rotem et al., 2014; Spoon et al., 2014, Interian et al., 2012; Sayer et al., 2007).

Summary of Key Findings

Predisposing Factors

Demographic characteristics. The relationships between demographic characteristics (e.g., age, rank, marital status, education) and mental health service utilization were not as consistent as hypothesized. While a number of demographic variables were hypothesized as being significantly associated with utilization of mental health services, only education (post-deployment) and marital status (both time periods) were in fact associated. The rate of soldiers with education beyond high school increased following deployment and the odds of utilization among those with some college education or a degree were 1.5 times the odds of utilization of those who had a high school degree only. The finding that higher education was associated with mental health utilization is consistent with past findings (Sayer et al., 2007).

While the percentage of those who utilized mental health services at both time periods were too low to be analyzed, married soldiers appeared to report greater mental health service utilization at both time periods than single soldiers. These results should be interpreted with caution given the low cell counts. Utilization rates were found to be

8.65% and 14.89%, pre-deployment and post-deployment, respectively. These overall utilization rates are slightly lower than the 19.8% and 18.6% utilization rates found by Quartana and colleagues in 2003 and 2004. To provide context to these rates, more service members utilized mental health services in 2007 (42.1%) than at any other time during the administration of LCS from 2003 to 2009 and again in 2011.

Attitudes and Beliefs about Mental Health and Treatment. The hypotheses that the relationship between attitudes and beliefs about mental health and treatment and utilization would be moderated by marital status or marital status were not supported.

Enabling Factors

Structural barriers to care and stigma. Structural barriers to care were found to have positive but weak correlation to utilization while stigma was weakly and negatively associated with utilization at post-deployment period. Contrary to the initial hypotheses, neither structural barriers to care nor stigma interacted with marital status or marital satisfaction to predict mental health service utilization.

Marital satisfaction. This study introduced marital satisfaction as an enabling resource. As hypothesized, single soldiers were less likely to utilize mental health services than their married counterparts, as seen in the literature (Interian, et al., 2012; Sayer et al., 2007). Interestingly, while it was not the focus of this study, the results indicated that divorced or separated soldiers had the highest odds of utilization. This is also consistent with findings of a study that suggested that loss of a relationship may be a strong motivation to seek help (Fikretoglu, et al., 2007). Among those who were

married, relationship satisfaction decreased from pre-deployment to post-deployment period. Prior to deployment, the mean marital satisfaction score was higher among those who screened positive for depression and utilized mental health services (M = 3.75) compared to those who screened positive but did not utilize services (M = 3.23). Marital satisfaction scores were mixed at post-deployment periods. The mean marital satisfaction score for soldiers who screened positive for depression and utilized services was 3.78 while the score was 3.12 for those who screened positive but did not utilize services. Among soldiers who screened positive for PTSD, the mean marital satisfaction score was 3.00 among those who utilized services and 3.71 among those who did not.

This particular finding may further support the dual nature of how relationships can impact utilization and is consistent with Andersen's suggestion that quality of social relationships can serve to deter or promote utilization (1995). On one hand, spouses may positively influence mental health service utilization by providing encouragement. On the other hand, spouses may deter help-seeking behaviors by minimizing perceived need. Alternatively, soldiers may not seek treatment based on the perception that they are receiving necessary support from their spouses.

Although it was hypothesized that marital status and marital satisfaction would moderate the relationships between barriers to care and mental health service utilization, the findings of this study failed to support this. In fact, none of the three aspects of barriers to care (i.e., attitudes and beliefs, structural barriers to care, and stigma) predicted utilization and no interactions were found between marital status and barriers to care or

between marital satisfaction and barriers to care. Interaction results were mixed when it came to mental health symptoms. While PTSD did not interact with marital satisfaction to predict utilization, PTSD was a predictor of utilization at both time periods. These findings appear to support past finding by Fleury and colleagues that PTSD is a significant predictor of utilization when there is a need (2014). Also, as hypothesized, marital satisfaction and depression independently and jointly predicted mental health service utilization before deployment but not following deployment. Interestingly, lower marital satisfaction was linked to increased mental health service utilization. Presumably, satisfaction in a relationship may serve as a buffer to stressors and ameliorate symptoms of mental health problems, thus decreasing utilization. Alternatively, lower marital satisfaction may potentially exacerbate mental health symptoms and distress, increasing utilization.

Need Factors

As expected, the mean scores for both PTSD (M = 24.96 and M = 34.68) and depression (M = 5.34 and M = 7.09) as well as their prevalence rates increased following return from deployment. A significant relationship between PTSD and utilization was found post-deployment and significant relationships were found between depression and utilization at both time periods. The prevalence of PTSD was found to be 4.0% prior to deployment and 16.67% following return from deployment. The prevalence of depression was found to be 16.2% to 22.3%. The rates of PTSD are similar to rates found by studies using LCS data, which ranged from 15.0% to 18.0% post-deployment

(Kim et al., 2010; Hoge et al. 2004). However, the rates of depression were found to be higher in this sample when compared to an earlier study that used LCS data and found the rate to be 15.2% (Hoge et al., 2004). Overall, those who screened positive for either PTSD or depression were two to nearly three times more likely to utilize mental health services than those who did not screen positive. The findings are consistent with past findings that symptom severity is predictive of utilization (Sayer at al., 2007; Andersen 1995).

Limitations and Strengths

There are several limitations to this study and the interpretations of the findings should be considered within those limitations. First, data were self-reported by soldiers prior to deployment and three months following return from deployment. While, survey responses were anonymous, concerns about the veracity and reliability of the responses need to be acknowledged. Second, the sample is relatively small and only consists of soldiers so generalizability to all service members is limited. Further, the sample consisted primarily of enlisted personnel, male, and young with less than three years of military service, thus applicability of findings is limited. Each branch of the service has its unique values and norms that may affect the decision to seek treatment. The sample size for testing research questions 3 and 4 was especially small as only a portion of the sample was married. Likewise, the number of soldiers utilizing mental health services who also screened positive for PTSD or depression was low. The interpretation of the results may be limited to the sample itself and should be done with caution. Third, the periods when the data were collected represent the early years of OEF and initial phase of

OIF. The prevalence rates, utilization trends, perceived barriers to care, and marital satisfaction might have been different for those who had previously deployed and for those who were returning from their first deployment. While it is impossible to measure such effects, it is important to acknowledge their potential impact.

While there are several limitations to this study, there are strengths to note. The findings provide a glimpse of marital satisfaction, mental health symptoms, barriers to care, and utilization in the early years of OEF and OIF. Additionally, an important strength of this study is that responses were from a matched sample of soldiers, which provided the opportunity to examine and learn soldiers' perceptions before and after deployment. Synchronizing these findings with the current literature may provide insight into changes that may have occurred over many years of protracted combat operations. In addition, there are advantages of using logistic regressions. Logistic regression allowed for the dichotomization of the outcome variable, which contained positive responses to utilization of mental health services across different settings (i.e., civilian or military) and types of providers (i.e., mental health, primary health, and chaplain). This was a useful method to capturing information on any and all types of treatment seeking behaviors, regardless of the source.

Implications and Recommendations

Previous research has greatly expanded the knowledge of perceived barriers to seeking mental health treatment within the military (e.g., Kim et al., 2011; Hoge et al., 2004). The findings of this study support the need for further investigation of how marital

satisfaction influences mental health utilization. When examined individually, no single finding appears to indicate that marital satisfaction definitively facilitates utilization. However, together, the findings seem to indicate that being married is linked to increased utilization and that marital satisfaction may help explain utilization when there is a need factor (i.e., depression), marital satisfaction influences utilization. Soldiers in good marriages may elect not to utilize mental health services because of the support they receive from their spouses. These relationships may further broaden the positive effects of social relationships and integration on mental health outcomes. Alternatively, lower marital satisfaction may increase mental health service utilization for a number of reasons. First, perceived lack of support may worsen interpersonal conflicts within the family and distress, prompting soldiers to engage in treatment. Soldiers who are not satisfied with their marriages may seek services at higher rates due to lack of perceived or real support from their spouses, prompting them to turn outside of the marriage for support. Second, poor relationship adjustment may be a need factor in itself (Meis et al., 2010; Andersen, 1995). Examining the drivers of mental health service utilization among divorced, separated, and widowed service members may help researchers and military leaders better understand how to and what can increase utilization of mental health services.

Research, practice, and policy implications and recommendations are provided in an effort to further expand on these findings. These recommendations seek to build on existing knowledge, especially as it relates to leveraging intimate relationships, to address the underutilization of mental health services and promote treatment seeking behaviors

among service members. The results of the present study contribute to the knowledge base with information on the association between marital status and different aspects of barriers to care to explain utilization. Additionally, the findings also help inform the importance of examining and accounting for satisfaction in relationships to better our understanding of the complex nature of an individual's decision to seek mental health care.

Research Implications and Recommendations

Military personnel may be less likely to seek help from others due to perceived barriers to care, which are amplified in a culture that values physical and mental toughness and self-reliance. Although barriers to care could be deterring service members from seeking care, other reasons such as securing support from their support network, may exist to explain the underutilization of services. The findings of this study indicate that married soldiers are more likely to utilize mental health services than single soldiers following return from deployment. Presumably, service members may be leveraging relationships with their partners to communicate their concerns and obtain support. Thus, the first research implication is the need for increased research on intimate relationships, more specifically the satisfaction and quality of these relationships, and how they can positively influence treatment seeking when there is a perceived or evaluated mental health need. Future research should examine the specific resources and the conditions under which they can promote the use of mental health services. Being married may have both protective and enabling qualities that promote utilization.

However, going beyond marital status and examining the dynamic nature of marital relationships and the conditions under which spouses can help facilitate and normalize help-seeking behaviors is suggested.

In addition, given the finding that soldiers who reported being divorced, separated, or widowed appeared to be more likely to seek services than married or single soldiers, examining the factors that help explain this pattern should also be considered. Perhaps, as suggested by Fikretoglu and others, the loss of a relationship may be driving the utilization (2008). Alternatively, distress in relationships may be a need factor in itself (Meis, 2010). It would be important and useful for future studies to examine this trend with a larger sample across services.

The second research implication is that given that data collection occurred in the early years of OEF and OIF conflicts, it would be useful to follow the same group of service members over time. Of course, it is likely impractical to follow the same service members over a long period of time, especially given the many changes of assignments they experience over their military careers. However, longitudinal data would better reflect the effect of protracted combat operations and multiple separations from families that may impact service members' overall mental health and treatment seeking behavior over time.

Finally, research using measures that examine perceptions of various determinants of seeking care would benefit from further analyses. There may be considerable differences and changes in perceptions from pre-deployment to post-deployment periods.

In order to appropriately compare results from different times periods, especially when a major event such as exposure to traumatic experiences occur, researchers should ensure that instruments measure the same constructs across time periods.

Practice Implications and Recommendations

Widening spousal involvement throughout the deployment cycle and service members' military career is recommended. The findings of this study suggest that married soldiers are more likely to seek mental health treatment than single soldiers at post-deployment period. Presumably, having a partner who can monitor changes and functioning and prompt service members to seek care can be a critical facilitator. Thus, a systematic review and evaluation of marriage strengthening programs should be considered. The review of curricula can be leveraged to introduce education and awareness opportunities to both service members and spouses. Spouses can play a central role in guiding service members experiencing mental health problems to treatment and help support treatment adherence; they can provide reassurance and normalize help-seeking behaviors throughout the post-deployment period. In addition, marriage strengthening programs can help promote the stability of marriages within the military, which are already vulnerable to the stresses of multiple and prolonged deployments, absences, and moves. Underscoring the importance of building strong relationships and families is the high rate of attrition not only among those with mental health problems but those with V-codes as well (Wilson et al., 2009). These programs can be used to

strengthen families and potentially yield a myriad of benefits to the service member, spouse, families, and military.

Policy Implications and Recommendations

This study expanded on past findings by exploring the moderating effect of marital satisfaction on perceived barriers to care and utilization and mental health symptoms and utilization. According to the Behavioral Model of Health Services Use, enabling factors are mutable (1995). Presumably, service members with or without mental health symptoms hold some degree of perceived barriers to seeking mental health treatment. Therefore, the first recommendation is that policies that target perceived structural barriers, stigma, and marital satisfaction, which are proposed to have a degree of mutability, are examined. Admittedly, perceived structural barriers may be rooted in true institutional deficiencies such as lack of trained providers or access to timely appointments. Thus, military leaders should strengthen provision of services in practice as perceived barriers are often grounded in perception. Overall, the Department of Defense should continue to review and revise policies that may influence utilization of mental health services. While the Department has engaged in many efforts to promote utilization of mental health services, there are policies that are contradictory and confusing, such as command notification of mental health and substance abuse problems. Issuances of policies must be accompanied by enforcement. Ensuring compliance in practice will be essential in assuaging service members' concerns about the impact of treatment seeking on their careers.

Conclusions

This study examined the factors associated with mental health service utilization and marital satisfaction as moderator of the relationship between barriers to care and utilization and mental health symptoms and utilization. Few studies have examined the role of marital satisfaction and its influence on mental health service utilization in the context of barriers to care and symptom severity. The findings of this study provided support that marital status can help explain and predict utilization, marital satisfaction has a moderating effect in the presence of depression, and that PTSD is a predictor of utilization.

Spouses are sometimes seen to be in the periphery of military life. However, they can be central to military readiness by helping promote the wellbeing of service members and enhance pathways to help-seeking behaviors. Further research on how relationship quality and satisfaction impact mental health service utilization in the military may be beneficial. Investing on efforts to strengthen marriages may be fruitful in promoting stability, relationship quality and satisfaction, and retention. Development and promotion of clear policies on accessing mental health treatment may also help decrease barriers to treatment.

APPENDICES

Appendix A: IRB Determination Letter

CLEMSON
RESEARCH COMPLIANCE

January 30, 2015

Ms. Dana Lee
Clemson University
Institute on Family and Neighborhood Life
2038 Barre Hall
Clemson, SC 29634

OFFICE OF
RESEARCH COMPLIANCE

Clemson University
321 Calhoun Drive
223 Brackett Hall
Clemson, SC
29634-5704

P 864-656-1525
F 864-656-4475

RE: Use of a WRAIR dataset in your research study, The Relationship between Marital Quality and Barriers to Mental Health Care

Dear Ms. Lee,

The Clemson University Office of Research Compliance (ORC) has determined that the project identified above does not involve human subjects as defined in the Federal regulations governing the protection of human subjects in research [45 CFR 46.102(f)] and is, therefore, not subject to IRB review.

As per my review of your application to the WRAIR (Walter Reed Army Institute of Research) Human Subjects Protection Branch, at this time, this project will not involve either "intervention or interaction" with living individuals, or the collection or use of "identifiable private information" about living individuals. Therefore, IRB review is not required.

Please contact this office again if there are any changes to this project that might bring it under the purview of the IRB. It is the responsibility of the ORC to determine whether any specific research project falls within the definition of research with human subjects, as provided by Federal regulations and institutional policy.

Thank you for contacting us to check on whether your project required IRB review and approval.

Good luck with this project and please feel free to contact me if you have any questions.

Sincerely,

Laura A. Moll, M.A., CIP
IRB Administrator

Appendix B: Well-Being Survey

Demographics

Age (code: age)
18-19
20-24
25-29
30-39
40 or older

Gender (gender)
Male
Female

Race/Ethnicity (ethnic)
Caucasian/White
African American
Hispanic
Asian/Pacific Islander
Other (code: ethnicoth)

Highest level of civilian education? (educst2)
Some High School
GED
High School Diploma
Some College
Associate's Degree
Bachelor's Degree
Master's Degree
Doctorate Degree

Grade/Rank (rank)
E1-E4
E5-E6
E7-E9
O1-O3
O4-O9
WO1-WO5

How many YEARS have you been in the military? If less than 1 year, please mark "00" (yrsmil).
1, 2, 3, 4, 5, 6, 7, 8, 9

What is your marital status? (curmar2)
Single, never married

Married, living with spouse
Married but separated
Married, geographically separated
Divorced
Widowed

How many years have you been married to your CURRENT SPOUSE? (cusp02)
0, 1, 3, 4, 5, 6, 7, 8, 9

Marital Satisfaction
Please rate how much you disagree or agree with the following:
Strongly Disagree/Disagree/Neither Agree Nor Disagree/Agree/Strongly Agree
I have a good marriage (mar01)
My relationship with my spouse is very stable (mar02)
My relationship with my spouse makes me happy (mar03)
I really feel like a part of a team with my spouse (mar04)

Barriers to care
Rate each of the possible concerns that might affect your decision to receive mental health counseling or services if you ever had a problem:

I don't trust in mental health professionals (cncr01)
I don't know where to get help (cncr02)
I don’t have adequate transportation (cncr03)
It is difficult to schedule an appointment (cncr04)
There would be difficult getting time off work for treatment (cncr05)
Mental health care costs too much money (cncr06)
It would be embarrassing (cncr07)
It would harm my career (cncr08)
Members of my unit might have less confidence in me (cncr09)
My unit leadership might treat me differently (cncr10)
My leaders would blame me for the problem (cncr11)
I would be seen as weak (cncr12)
Mental health care doesn't work (cncr13)

Posttraumatic Stress Disorder (Posttraumatic Stress Disorder Checklist)

Repeated, disturbing memories, thoughts, or images of the stressful experience (strs01)
Repeated, disturbing dreams of the stressful experience (strs02)
Suddenly acting or feeling as if the stressful experience were happening again (as if you were re-living it) (strs03)
Feeling very upset when something reminded you of the stressful experience (strs04)
Having physical reactions (like heat pounding, trouble breathing, sweating) when something reminded you of the stressful experience (strs05)

Avoiding thinking about or talking about the stressful experience or avoiding having feelings related to it (strs06)
Avoiding activities or situations because they reminded you of the stressful experience (strs07)
Trouble remembering important parts of the stressful experience (strs08)
Loss of interest in activities that you used to enjoy (strs09)
Feeling distant or cut-off from other people (strs10)
Feeling emotionally numb or being unable to have loving feelings for those close to you (strs11)
Feeling as if your future somehow will be cut short (strs12)
Trouble falling or staying asleep (strs13)
Feeling irritable or having angry outbursts (strs14)
Having difficulty concentrating (strs15)
Being "super alert" or watchful or on-guard (strs16)
Feeling jumpy or easily startled (strs17)

Depression (Patient Health Questionnaire-9)
Little interest or pleasure in doing things (mood02)
Feeling down, depressed, or hopeless (mood03)
Trouble falling or staying asleep, or sleeping too much (mood04)
Feeling tired or having little energy (mood05)
Poor appetite or overeating (mood06)
Feeling bad about yourself – or that you are a failure or have let yourself or your family down (mood07)
Trouble concentrating on things, such as reading the newspaper or watching television (mood08)
Moving or speaking so slowly that other people could have noticed (mood09)
Thoughts that you would be better off dead or of hurting yourself in some way (mood13)

Utilization of Mental Health Services
In the PAST YEAR did you receive mental health services for a stress, emotional, alcohol, or family problem?
From a mental health professional at a military facility? (mhpy01)
From a general medical doctor at a military facility? (mhpy02)
From a military chaplain? (mhpy03)
From a mental health professional at a civilian facility? (mhpy04)
From a general medical doctor at a civilian facility? (mhpy05)
From civilian clergy? (mhpy0)

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